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THE

EDINBURGH PRACTICE

OF

PHYSIC, SURGERY,

AND

MIDWIFERY;

PRECEDED BY

AN ABSTRACT OF THE THEORY OF MEDICINE,

AND

THE NOSOLOGY OF DR. CULLEN.

AND INCLUDING

UPWARDS OF SIX HUNDRED AUTHENTIC FORMULÆ,

FROM THE BOOKS OF ST. BARTHOLOMEW'S, ST. GEORGE'S, ST. THOMAS'S, GUY'S, AND OTHER HOSPITALS IN LONDON, AND FROM THE LECTURES AND WRITINGS OF THE MOST EMINENT PUBLIC TEACHERS.

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SURGERY.

REGISTERED MEDICAL SOCIETY

CHAP. I. Of WOUNDS.

Sect. I. *Of Simple* Wounds.

THE firſt thing to be conſidered in the inſpection of a wound is, whether it is likely to prove mortal or not. This knowledge can only be had from anatomy, by which the ſurgeon will be able to determine what parts are injured; and, from the offices which theſe parts are calculated to perform, whether the human frame can ſubſiſt under ſuch injuries. It is not, however, eaſy for the moſt expert anatomiſt always to prognoſticate the event with certainty; but this rule he ought always to lay down to himſelf, to draw the moſt favourable prognoſis the caſe will bear, or even more than the rules of his art will allow. This is particularly incumbent on him in ſea-engagements, where the ſentence of death is executed as ſoon as pronounced, and the patient may be thrown alive into the ſea, upon the ſurgeon's declaring his wound to be mortal. There are, beſides, many inſtances on record, where wounds have healed, which the moſt ſkilful ſurgeons have deemed mortal. The following wounds may be reckoned mortal.

1. Thoſe which penetrate the cavities of the heart, and all thoſe wounds of the viſcera where the large blood-veſſels are opened; becauſe their ſituation will not admit of proper applications to reſtrain the flux of blood.

2. Thoſe which obſtruct or entirely cut off the paſſage of the nervous influence through the body. Such are wounds of the brain, cerebellum, medulla oblongata, and ſpinal marrow: though the brain is ſometimes injured, and yet the patient recovers. Wounds likewiſe of the ſmall blood-veſſels within the brain are attended with great danger, from the effuſed fluids preſſing upon the brain. Nor is there leſs danger where the nerves which tend to the heart are wounded, or entirely divided; for, after this, it is impoſſible for the heart to continue its motion.

3. All wounds which entirely deprive the animal of the faculty of breathing.

4. Thoſe wounds which interrupt the courſe of the chyle to the heart: ſuch are wounds of the receptacle of the chyle, thoracic duct, and large lacteals, &c.

5. There are other wounds which prove fatal if neglected and left to nature; ſuch are wounds of the large external blood-veſſels, which might be remedied by ligature.

In examining wounds, the next conſideration is, whether the parts injured are ſuch as may be ſuppoſed to induce dangerous ſymptoms, either immediately or in ſome time during the courſe of the cure. In order to proceed with any degree of certainty, it is neceſſary to be well acquainted with thoſe ſymptoms which attend injuries of the different parts of the body. If the ſkin only and part of the cellular ſubſtance is divided, the firſt conſequence is an effuſion of blood; the lips of the wound retract, become tumefied, red, and inflamed, leaving a gap of conſiderable wideneſs according to the length and deepneſs of the wound. Beſides, if a very conſiderable portion of ſkin and cellular ſubſtance is divided, a ſlight fever ſeizes the patient; the effuſion of blood in the mean time ſtops, and the wound is partly filled up with a cake of coagulated blood. Below this cake, the ſmall veſſels pour forth a clear liquor, which in a ſhort time is converted into pus. Below this pus granulations of new fleſh ariſe, the cake of coagulated blood looſens, a new ſkin covers the place where the wound was, and the whole is healed up; only there remains a mark, called a *cicatrix* or *ſcar*, ſhowing where the injury had been received.

All wounds are accompanied with a conſiderable degree of pain, eſpecially when the inflammation comes on, though the diviſion reaches no farther than the ſkin and cellular ſubſtance. If the muſcular fibres are divided, the pain is much greater, becauſe the ſound part of the muſcle is ſtretched by the contraction of the divided part and the action of the antagoniſt muſcle, which it is now leſs fitted to bear. The wound alſo gapes much more than where the cellular ſubſtance only is divided, inſomuch that, if left to itſelf, the ſkin will cover the muſcular fibres, without any intervention of cellular ſubſtance; and not only a very unſightly cicatrix remains, but the uſe of the muſcle is in ſome meaſure loſt.—If the muſcle happens to be totally divided, its parts retract to a very conſiderable diſtance; and unleſs proper methods be taken, the uſe of it is certainly loſt ever afterwards.

If by a wound any conſiderable *artery* happens to be divided, the blood flows out with great velocity, and by ſtarts; the patient ſoon becomes faint with loſs of blood; nor does the hæmorrhagy ſtop until he faints away altogether, when the ends of the divided veſſel cloſe by their natural contractility; and if as much *vis vitæ* ſtill remains as is ſufficient to renew the operations of life, he recovers after ſome time, and the wound heals up as uſual. The part of the artery which is below the wound in the mean time becomes uſeleſs, and its ſides collapſe, ſo that all the inferior part of the limb would be deprived of blood, were it not that the ſmall branches ſent off from the artery above the wounded place become

become enlarged, and capable of carrying on the circulation. Nature alſo, after a wonderful manner, often produces new veſſels from the ſuperior extremity of the divided artery, by which the circulation is carried on as formerly. However, the conſequences of ſuch a profuſe hæmorrhagy may be very dangerous to the patient, by inducing extreme debility, concretions of coagulable lymph in the heart and large veſſels, or an univerſal dropſy. This happens eſpecially where the artery is partially divided; becauſe then the veſſel cannot contract in ſuch a manner as to cloſe the orifice: however, if the wound is but ſmall, the blood gets into the cellular ſubſtance, ſwelling up the member to an extreme degree, forming what is called a *diffuſed aneuriſm*. Thus the hæmorrhagy ſoon ſtops externally, but great miſchief may proceed from the confinement of the extravaſated blood, which is found to have the power of cauſing an abſorption not only of the fleſhy parts, but alſo of the bones themſelves; and thus not only the uſe of the limb is entirely loſt, but the patient is brought into great danger of his life, if proper aſſiſtance be not obtained in a ſhort time.

Wounds of the *ligaments*, *nerves*, and *tendons*, are likewiſe attended with bad conſequences. When a nerve is entirely divided, the pain is but trifling, though the conſequences may be dangerous. If the nerve is large, all the parts to which it is diſtributed below the wound immediately loſe the power of motion and ſenſation: nor is it uncommon, in ſuch caſes, for them to be ſeized with a gangrene. This, however, takes place only when all or the greateſt part of the nerves belonging to a particular part are divided. If the ſpinal marrow, for inſtance, be divided near the head, the parts below ſoon loſe their action irrecoverably; or if the bundle of nerves paſſing out of the axilla be divided or tied, ſenſation in the greateſt part of the arm below will probably be loſt. But though a nerve ſhould be divided, and a temporary palſy be produced, it may again re-unite, and perform its proper functions. If a nerve be wounded only, inſtead of being divided, the worſt ſymptoms frequently enſue.

Wounds which penetrate the cavities of the *thorax* are always exceedingly dangerous, becauſe there is ſcarce a poſſibility of all the viſcera eſcaping unhurt. A wound is known to have penetrated the cavity of the thorax principally by the diſcharge of air from it at each inſpiration of the patient, by an extreme difficulty of breathing, coughing up blood, &c. Such wounds, however, are not always mortal; the lungs have frequently been wounded, and yet the patient has recovered.—Wounds of the diaphragm are almoſt always mortal, either by inducing fatal convulſions immediately, or by the aſcent of the ſtomach, which the preſſure of the abdominal muſcles forces up through the wound into the cavity of the thorax; of this Van Swieten gives ſeveral inſtances.—Even though the wound does not penetrate into the cavity of

the thorax, the very worſt ſymptoms may follow. For if the wound deſcends deeply among the muſcles, and its orifice lies higher, the extravaſated humours will be therein collected, ſtagnate, and corrupt in ſuch a manner as to form various ſinuſes; and after having eroded the pleura, it may at length paſs into the cavity of the thorax. The matter having once found a vent into this cavity, will be continually augmenting from the diſcharge of the ſinuous ulcer, and the lungs will at laſt ſuffer by the ſurrounding matter. If, in caſes of wounds in the thorax, the ribs or ſternum happen to become carious, the cure will be extremely tedious and difficult. Galen relates the caſe of a lad who received a blow upon his ſternum in the field of exerciſe: it was firſt neglected, and afterwards badly healed; but four months afterwards, matter appeared in the part which had received the blow. A phyſician made an inciſion into the part, and it was ſoon after cicatrized: but in a ſhort time afterwards a new collection of matter made its appearance, and upon a ſecond inciſion the wound refuſed to heal. Galen found the ſternum carious; and having cut off the diſeaſed part, the pericardium itſelf was obſerved to be corroded, ſo that the heart could be ſeen quite naked; notwithſtanding which, the wound was cured in no very long time.

There is ſometimes difficulty in determining whether the wound has really penetrated into the thorax or the abdomen; for the former deſcends much farther towards the ſides than at the middle. But as the lungs are almoſt always wounded when the cavity of the thorax is penetrated, the ſymptoms ariſing from thence can ſcarcely be miſtaken.—Another ſymptom which frequently, though not always, attends wounds of the thorax, is an *emphyſema*. This is occaſioned by the air eſcaping from the wounded lungs, and inſinuating itſelf into the cellular ſubſtance; which being pervious to it over the whole body, the tumor paſſes from one part to another, till at laſt every part is inflated to a ſurpriſing degree. An inſtance is given in the Memoirs of the Royal Academy, of a tumor of this kind, which on the thorax was eleven inches thick, on the abdomen nine, on the neck ſix, and on the reſt of the body four; the eyes were in a great meaſure thruſt out of their orbits by the inflation of the cellular ſubſtance; and the patient died the fifth day. This was occaſioned by a ſtab with a ſword.

Wounds of the *abdomen* are not leſs dangerous than thoſe of the thorax, on account of the importance of the viſcera which are lodged there. When the wound does not penetrate the cavity, there is ſome danger of an hernia being formed by the protruſion of the peritonæum through the weakened integuments, and the danger is greater the larger the wound is. Thoſe wounds which run obliquely betwixt the interſtices of the muſcles often produce ſinuous ulcers of a bad kind. For as there is always a large

quantity of fat interpoſed every-where betwixt the muſcles of the abdomen, if a wound happens to run between them, the extravaſated humours, or matter there collected, not meeting with free egreſs through the mouth of the wound, often makes its way in a ſurpriſing manner through the cellular ſubſtance, and forms deep ſi uoſities between the muſcles; in which caſe the cure is always difficult, and ſometimes impoſſible.

If a large wound penetrates the cavity of the abdomen, ſome of the viſcera will certainly be protruded through it; or if the wound is but ſmall, and cloſed up with fat ſo that none of the inteſtines can be protruded, we may know that the cavity of the abdomen is pierced, and probably ſome of the viſcera wounded, by the acute pain and fever, paleneſs, anxiety, faintings, hiccough, cold ſweats, and weakened pulſe, all of which accompany injuries of the internal parts. The miſchiefs which attend wounds of this kind proceed not only from the injury done to the viſcera themſelves, but from the extravaſation of blood and the diſcharge of the contents of the inteſtines into the cavity of the abdomen; which, being of a very putreſcent nature, ſoon bring on the moſt violent diſorders. Hence wounds of the abdominal viſcera are very often mortal. This, however, is not always the caſe, for the ſmall inteſtines have been totally divided, and yet the patient has recovered. Wounds both of the ſmall and large inteſtines have healed ſpontaneouſly, even when they were of ſuch magnitude that the contents of the inteſtine was freely diſcharged through the wound in it, and after part of the inteſtine itſelf has been protruded through the wound of the integuments.

When the *meſentery* is injured, the danger is extreme, on account of the numerous veſſels and nerves ſituated there. Wounds of the liver, ſpleen, and pancreas, are alſo exceedingly dangerous, although there are ſome inſtances of the ſpleen being cut out of living animals without any conſiderable injury.

From the preceding account of the ſymptoms attending wounds in the different parts of the body, the ſurgeon may be enabled to judge in ſome meaſure of the event; though it muſt always be remembered, that wounds, even thoſe which ſeemed to be of the ſlighteſt nature, have, contrary to all expectation, proved mortal, chiefly by inducing convulſions, or a locked jaw; ſo that no certain prognoſtic can be drawn on ſight of recent wounds. We ſhall now, however, proceed to conſider their treatment.

Treatment of wounds.

For the cure of wounds, it has been already obſerved, that the ancients imagined balſams, the juice of herbs, &c. to be a kind of ſpecifics. In after ages, and in countries where balſams are not eaſily to be procured, ſalves have been ſubſtituted in their place; and even at this day there are many who reckon a ſalve

or ointment eſſentially neceſſary for healing the ſlighteſt cut. It is certain, however, that the cure of wounds cannot be effected, nay, not even forwarded in the leaſt, by ointments, unleſs in particular caſes or by accident. That power which the human frame has of repairing the injuries done to itſelf, which by phyſicians is called *vis medicatrix naturæ*, is the ſole agent in curing external injuries; and without this the moſt celebrated ballams would prove ineffectual. When a wound has been made with a ſharp inſtrument, and is not extenſive, if it be immediately cleaned, and all the extravaſated blood removed, it will almoſt always heal by the firſt intention in a very ſhort time. Indeed the cures performed by this ſimple proceſs are ſo ſurpriſing, that they would be incredible were we not aſſured of their reality by eye-witneſſes. When this proceſs is either neglected or proves unſucceſsful, there are three ſtages to be obſerved in the cure of a wound: the firſt, called *digeſtion*, takes place when the ends of the wounded veſſels contract themſelves, and pour out the liquor which is converted into pus. As ſoon as this appears, the ſecond ſtage, in which the fleſh begins to *grow up*, takes place; and as this proceeds, the edges of the wound acquire a fine bluiſh or pearl colour, which is that of the new ſkin beginning to cover the wound as far as the fleſh has filled it up. This proceſs continues, and the ſkin advances from all ſides towards the centre, which is called the *cicatrizing* of the wound. For the promoting of each of theſe proceſſes, ſeveral ointments were formerly much in vogue. But it is now found, that no ointment whatever is capable of promoting them; and that it is only neceſſary to keep the wound clean, and to prevent the air from having acceſs to it. This, indeed, nature takes care to do, by covering the wound with a cake of coagulated blood; but if a wound of conſiderable magnitude ſhould be left entirely to nature, the pus would form below the cruſt of coagulated blood in ſuch quantity, that it would moſt probably corrupt, and the wound degenerate into a corroding ulcer. It is neceſſary, therefore, to cleaſe the wound frequently; and for this purpoſe it will be proper to apply a little ointment ſpread on ſoft ſcraped lint. For the firſt dreſſing, dry lint is uſually applied, and ought to be allowed to remain for two or three days, till the pus is perfectly formed; after which the ointment may be applied as juſt now directed; and in a healthy body, the wound will heal without further trouble. As to the ointment employed, it is almoſt indifferent what it be, provided it has no acrid or ſtimulating ingredient in its compoſition.

The following ſimple and convenient formulæ are employed at the different hoſpitals:

(No. 1.) ℞ Emplaſtrum lithargyri
Adipis ſuillæ ſing. lib. ſs.
Ceræ flavæ unc. j.
Aquæ lithargyri acetati unc. iv.

In preparing this cerate, the three firſt ingredients muſt be melted together, and when almoſt cold, the water of acetated litharge is to be gradually incorporated, ſtirring the whole till perfectly cold.

(No. 2.) ℞ Ceræ flavæ.
Adipis ſuillæ præparatæ ſing. lib. ſs.
Reſinæ flavæ unc. ſs.
Hydrargyri ſulphurati rubri gran. xv.

(No. 3.) ℞ Lithargyri levigati lib. j.
Aceti cong. j.
Saponis unc. viij.
Olei olivæ.
Ceræ flavæ ſing. lib. j.

This is the *ſoap cerate* of St. Bartholomew's Hoſpital, and adopted lately by the College. In preparing it, the utmoſt caution muſt be uſed. The three firſt ingredients are to be mixed together and boiled gently till all the moiſture is evaporated, after which the wax and oil, previouſly melted together, muſt be added. The whole compoſition, from firſt to laſt, muſt be inceſſantly and effectually ſtirred, without which the whole will be ſpoiled. This cerate which was introduced into practice by the late Mr. Pott, is alſo found to be a very convenient application in fractures, being of a very convenient degree of adheſiveneſs, and alſo poſſeſſing the uſual properties of a ſaturnine remedy.

But though, in general, wounds thus eaſily admit of a cure, there are ſeveral circumſtances which require a different treatment, even in ſimple diviſions of the fleſhy parts, when neither the membranous nor tendinous parts are injured. Theſe are,

1. Where the wound is large, and gapes very much, ſo that, if allowed to heal in the natural way, the patient might be greatly diſfigured by the ſcar. It is proper to bring the lips of the wound near to each other, and to join them either by adheſive plaſter, or by ſuture, as the wound is more ſuperficial, or lies deeper.

2. When foreign bodies are lodged in the wound, as when a cut is given by glaſs, &c. it is neceſſary by all means to extract them, before the wound is dreſſed; for it will never heal until they are diſcharged. When theſe bodies are ſituated in ſuch a manner as not to be capable of being extracted without lacerating the adjacent parts, which would occaſion violent pain and other bad ſymptoms, it is neceſſary to enlarge the wound, ſo that theſe offending bodies may be eaſily removed. This treatment, however, is chiefly neceſſary in gun-ſhot wounds, of which we ſhall treat in another ſection.

3. When the wound is made in ſuch a manner that it runs for ſome length below the ſkin, and the bottom is much lower than the orifice, the matter collected from all parts of the wound will be lodged in the bottom of it, where, corrupting by the heat, it

will degenerate into a fiſtulous ulcer. To prevent this, we muſt uſe compreſſes, applied ſo that the bottom of the wound may ſuffer a more conſiderable preſſure than the upper part of it. Thus the matter formed at the bottom will be gradually forced upwards, and that formed at the upper part will be incapable of deſcending by its weight; the divided parts, in the mean time, eaſily uniting when brought cloſe together. Indeed, the power which nature has of uniting different parts of the human body is very ſurpriſing; for, according to authors of credit, even if a piece of fleſh be totally cut out, and applied in a ſhort time afterwards to the place from whence it was cut, the two will unite. That a part cut out of a living body does not entirely loſe its vital power for ſome time, is evident from the modern practice of tranſplanting teeth; and from an experiment of Mr. Hunter's at London: he put the teſticle of a cock into the belly of a living hen, which adhered to the liver, and became connected to it by means of blood-veſſels. We have therefore the greateſt reaſon to hope, that the divided parts of the human body, when cloſely applied to each other, will cohere without leaving any ſinus or cavity between them. However, if this method ſhould fail, and matter ſtill be collected in the depending part of the wound, it will be neceſſary to make an opening in that part in order to let it out; after which the wound may be cured in the common way.

4. During the courſe of the cure, it ſometimes happens that the wound, inſtead of filling up with fleſhy granulations of a florid colour, ſhoots up into a glaſſy-like ſubſtance which riſes above the level of the ſurrounding ſkin, while, at the ſame time, inſtead of laudable pus, a thin ill-coloured and fetid ichor is diſcharged. In this caſe, the lips of the wound loſe their beautiful pearl colour, and become callous and white, nor does the cicatrizing of the wound at all advance. When this happens in a healthy patient, it generally proceeds from ſome improper management, eſpecially the making uſe of too many emollient and relaxing medicines, or an immoderate uſe of balſams and ointments. Frequently nothing more is requiſite for taking down this fungus than dreſſing with dry lint; at other times deſiccative powders, ſuch as calamine, tutty, calcined alum, &c. will be neceſſary; and ſometimes red nitrated mercury muſt be uſed. This laſt, however, is apt to give great pain, if ſprinkled in its dry ſtate upon the wound; it is therefore moſt proper to grind it with ſome yellow reſin ointment, which makes a much more gentle, though at the ſame time an efficacious eſcharotic. Touching the overgrown parts with blue vitriol is alſo found very effectual.

Hitherto we have conſidered the wounded patient as otherwiſe enjoying a ſtate of perfect health; but it muſt be obſerved, that a large wound is capable of diſordering the ſyſtem to a great

degree, and inducing dangerous diſeaſes which did not before exiſt.—If the patient is ſtrong and vigorous, and the pain and inflammation of the wound great, a conſiderable degree of fever may ariſe, which it will be neceſſary to check by bleeding, low diet, and other parts of the antiphlogiſtic regimen, at the ſame time that the inflamed lips of the wound and parts adjacent are to be treated with emollient fomentations or cataplaſms till the pain and ſwelling abate. On the other hand, it may happen, when the patient is of a weak and lax habit, that the vis vitæ may not be ſufficient to excite ſuch an inflammation in the wound as is abſolutely neceſſary for its cure. In this caſe, the edges of the wound look pale and ſoft; the wound itſelf ichorous and bloody, without any ſigns of fleſhy granulations; or if any new fleſh ſhoots up, it is of the fungous glaſſy kind above mentioned. To ſuch wounds all external applications are vain: it is neceſſary to ſtrengthen the patient by proper internal remedies, among which the bark has a principal place, until the wound begins to alter its appearance. In ſuch perſons, too, there is ſome danger of a hectic fever by the abſorption of matter into the body when the wound is larger; and this will take place during the courſe of the cure, even when appearances have been, at firſt, as favourable as could be wiſhed. This happens generally when the wound is large, and a great quantity of matter formed: for by this diſcharge the patient is weakened; ſo that the pus is no ſooner formed, than it is, by the abſorbent veſſels, re-conveyed into the body, and feveriſh heats immediately affect the patient. For this the beſt remedy is to exhibit the bark copiouſly, at the ſame time ſupporting the patient by proper cordials and nouriſhing diet. Indeed, in general, it will be found, that in the caſe of wounds of any conſiderable magnitude, a more full and nouriſhing regimen is required than the patient, even in health, has been accuſtomed to: for the diſcharge of pus alone, where the quantity is conſiderable, proves very debilitating, if the patient is not ſtrengthened by proper diet. And it is conſtantly found, that the cure of ſuch ſores goes on much more eaſily when the patient is kept in his uſual habit of body, than when his ſyſtem is much emaciated by a very low allowance; and, for the ſame reaſon, purgatives, and whatever elſe tends to weaken the conſtitution, are improper in the cure of wounds.

Hæmorrhagies.

Profuſe bleeding very frequently happens in wounds, either from a diviſion of one large artery, or of a number of ſmall ones. In this caſe, the firſt ſtep to be taken by the ſurgeon is to effect a temporary ſtoppage of the blood by means of compreſſion. He is then to tie up all the veſſels in the manner to be afterwards deſcribed.

When the principal arteries of a wound have been tied, and a little blood continues to be discharged, but appears to come from sundry small vessels only, an experienced surgeon is induced to think, that the necessary compression of the bandages will, in all probability, effect a total stoppage of the hæmorrhagy. In a general oozing of a small quantity of blood from the whole surface of a sore, and when no particular vessel can be distinguished, there is a necessity for trusting to this remedy; but whenever an artery can be discovered, of whatever size it may be, it ought unquestionably to be secured by a ligature. But it frequently happens, that considerable quantities of blood are discharged, not from any particular vessel, but from all the small arteries over the surface of the sore. In wounds of great extent, particularly after the extirpation of cancerous breasts, and in other operations where extensive sores are left, this species of hæmorrhagy often proves very troublesome, by being exceedingly difficult to suppress.

Bleedings of this kind seem evidently to proceed from two very different and opposite causes. *First*, either from too great a quantity of blood contained in the vessels, or from an over-degree of tone in the vessels themselves; or, perhaps, from a combination of both these causes. But, *secondly*, such evacuations undoubtedly happen most frequently in such constitutions as are very relaxed and debilitated; either from a particular state of the blood, or from a want of tone in the containing vessels, or, in some instances, from a concurrence of both.

In constitutions perfectly healthy, on the occurrence of wounds even of the most extensive nature, as soon as the larger arteries are secured, all the small vessels which have been divided are diminished, not only in their diameters, but also in their length; in consequence of which, they recede considerably within the surface of the surrounding parts. This cause of itself would probably, in the greatest number of instances, prove sufficient for restraining all loss of blood from the smaller arteries. Another very powerful agent, however, is provided by nature for producing the same effect. From the extremities of the divided vessels, which at first discharged red blood only, there now, in their contracted state, oozes out a more thin, though viscid fluid, containing a great proportion of the coagulable parts of the blood; and this being equally distributed over the surface of the wound, by its balsamic agglutinating powers, has a very considerable influence in restraining all such hæmorrhages.

When a tedious oozing occurs in a patient young and vigorous, and where the tone of the muscular fibres is evidently great, the most effectual means of putting a stop to the discharge is to relax the vascular system, either by opening a vein in some other part, or, what gives still more immediate relief, by untying the ligature

on one of the principal arteries of the part, so as to allow it to bleed freely: those violent spasmodic twitchings, too, so frequent after operations on any of the extremities, when they do not depend on a nerve being included in the ligature with the artery, are in this manner more effectually relieved than by any other method.

By the same means, the patient, from being in a febrile heat and much confused, soon becomes very tranquil: the violent pulsation of the heart and large arteries abates, and the blood not being propelled with such impetuosity into the smaller vessels of the part, they are thereby left at more liberty to retract. In the mean time the patient ought to be kept exceedingly cool; wine and other cordials should be rigidly avoided; cold water, acidulated either with the mineral or vegetable acids, ought to be the only drink; motion of every kind, particularly of the part affected, should be guarded against; and the wound being gently covered with soft charpie, ought to be tied up with a bandage so applied as to produce a moderate degree of pressure on the extremities of the divided parts.

As soon as a sufficient quantity of blood has been discharged, the wound being dressed, and the patient laid to rest, a dose of opium, proportioned to the violence of the symptoms, ought to be immediately exhibited. It ought to be remarked, however, that in all such circumstances, much larger doses of that remedy are necessary than in ordinary cases requiring the use of opiates. Small doses, instead of answering any good purpose, seem frequently rather to aggravate the various symptoms; so that whenever they are here had recourse to, they ought always to be given in quantities sufficient for the intended effect.

But hæmorrhagies of this nature happen much more frequently in relaxed enfeebled habits, where the solids have lost part of their natural firmness, and the fluids have acquired a morbid tenuity. In this case, a moderate use of generous wine ought to be immediately prescribed; for nothing tends so much, in such circumstances, to restrain hæmorrhagies, as a well-directed use of proper cordials. By tending to invigorate and brace the solids, they enable the arterial system to give a due resistance to the contained fluids; and have also a considerable influence in restoring to the fluids that viscidity of texture, of which, in all such instances, we suppose them to be deprived.

A nourishing diet also becomes proper; the patient ought to be kept cool; and the mineral acids, from their known utility in every species of hæmorrhagy, ought also to be prescribed. Rest of body is here also proper; and opiates, when indicated either by pain or spasmodic affections of the muscles, ought never to be omitted.

Together with these remedies adapted to the general system, particular dressings, appropriated to the state of the parts to

which they are to be applied, have been found very beneficial. In healthy conſtitutions, ſoon after the diſcharge of blood is over, the parts are covered with a viſcid coagulable effuſion, from the mouths of the newly retracted arteries; but in conſtitutions of an oppoſite nature, where the ſolids are much relaxed, the blood in general is found in ſuch an attenuated ſtate as to afford no ſecretion of this nature.

To ſupply asmuch as poſſible the deficiency of this natural balſam, different artificial applications have been invented. Duſting the part with ſtarch or wheat-flour has ſometimes been found of uſe, and gum-arabic in fine powder has been known to anſwer when theſe failed.

Applications of this kind, indeed, have been uſed with ſucceſs in all ſuch hæmorrhagies, with whatever habit of body they happen to be connected; but they have always proved more particularly ſerviceable in relaxed conſtitutions, attended with an attenuated ſtate of the blood, and an enfeebled muſcular ſyſtem. Alcohol, or any other ardent ſpirits, impregnated with as great a quantity as they can diſſolve of myrrh, or any other of the heating viſcid gums, may be here uſed with freedom, though in conſtitutions of an oppoſite nature they ought never to be employed. The Tinctura Benzoes compoſita of the ſhops, a remedy of this nature, has long been famous for its influence in ſuch caſes: but that indiſcriminate uſe of this and ſimilar applications, which has prevailed heretofore with ſome practitioners, has undoubtedly done much harm; for as they are all poſſeſſed of very ſtimulating powers, they of courſe tend to aggravate every ſymptom in wounds connected with a tenſe ſtate of the fibres, when much pain, and eſpecially when ſpaſmodic muſcular affections, prevail.

By a due perſeverance in one or other of the plans here pointed out, it will ſeldom happen that hæmorrhagies of this nature are not at laſt put a ſtop to: but when the contrary does occur, when, notwithſtanding the uſe of the remedies recommended, a diſcharge of blood ſtill continues, together with the means already adviſed, an equal moderate preſſure ought to be applied over the whole ſurface of the ſore, to be continued as long as the neceſſity of the caſe ſeems to indicate.

In finiſhing the dreſſing of ſuch wounds, after the charpie and compreſſes have been applied, a bandage, properly adapted to the part, ought to include the whole, and in ſuch a manner as to produce as equal a degree of preſſure over the ſurface of the ſore as poſſible. But it now and then happens, that no bandage whatever can be ſo applied as to produce the deſired effect; and in ſuch caſes the hand of an aſſiſtant is the only reſource; which being firmly applied over the dreſſings, ſo as to produce a very equal degree of preſſure, will commonly ſucceed when no other remedy is found to have much influence.

Injuries from blood-letting.

Wounds of the nerves, tendons, and ligaments, are attended with much more violent ſymptoms than thoſe where even conſiderable arteries are divided, and frequently reſiſt every method of cure propoſed by the moſt ſkilful practitioners. In the ſimple proceſs of blood-letting, it frequently happens that the tendinous expanſion called the *aponeuroſis* of the biceps muſcle is wounded, or even the tendon of that muſcle itſelf is punctured by the point of the lancet; or ſometimes a nerve which happens to lie in the neighbourhood is partially divided. Wounds of this deſcription, though they are the ſmalleſt we can well ſuppoſe to be given, are frequently very dangerous and difficult of cure. It ſometimes immediately happens on the introduction of the lancet, that the patient complains of a moſt exquiſite degree of pain; and when this occurs, we may reſt aſſured that either a nerve or tendon has been wounded. On ſome occaſions, by proper management, ſuch as evacuating a conſiderable quantity of blood at the orifice newly made, by keeping the part at perfect reſt, and preſerving the patient in as cool a ſtate as poſſible, the pain at firſt complained of will gradually abate, and at laſt go off entirely, without any bad conſequence whatever. At other times, however, this pain, which occurs inſtantaneouſly on the introduction of the lancet, inſtead of abating, begins ſoon to increaſe; a fullneſs, or ſmall degree of ſwelling, takes place in the parts contiguous to the wound; the lips of the ſore become ſomewhat hard and inflamed; and, in the courſe of twenty-four hours or ſo from the operation, a thin watery ſerum begins to be diſcharged at the orifice.

If, by the means employed, relief is not ſoon obtained, theſe ſymptoms generally continue in nearly the ſame ſtate for two or perhaps three days longer. At this time, the violent pain which at firſt took place becomes ſtill more diſtreſſing; but inſtead of being ſharp and acute as before, it is now attended with the ſenſation of a burning heat, which ſtill goes on to increaſe, and proves, during the whole courſe of the ailment, a ſource of conſtant diſtreſs to the patient. The fullneſs and hardneſs in the lips of the wound begin to increaſe, and the ſwelling in the neighbouring parts gradually extends over the whole member. The parts at laſt become exceedingly tenſe and hard; an eryſipelatous inflammatory colour frequently appears over the whole ſurface; the pulſe, by this time, has generally become very hard and quick; the pain is now intenſe; the patient exceedingly reſtleſs; twitchings of the tendons occur to a greater or leſs degree; on ſome occaſions, a locked jaw and other convulſive affections ſupervene; and all theſe ſymptoms continuing to increaſe, it moſt frequently happens that the torture under which the patient has been groaning is at laſt terminated by death.

Different opinions have prevailed respecting the cause of these symptoms. By some they have been imputed to wounds of the tendons. By others the tendons are supposed to be so entirely destitute of sensibility, as to be quite incapable of producing so much distress; so that wounds of the nerves, they consider, on all such occasions, as the true cause of the various symptoms we have mentioned.

One or other of these ideas continued to be the only source for explaining the various phenomena found to occur in this malady, till a different opinion was suggested by the late ingenious Mr. John Hunter. This writer supposes, that all the dreadful symptoms found now and then to be induced by the operation of blood-letting, may be more readily accounted for from an inflamed state of the internal surface of the vein, than from any other cause. Such a state of the vein he often traced in horses that died of such symptoms from venesection, and the same appearances have sometimes occurred also in a human body. On other occasions, inflammation having in this manner been once excited, has been known to terminate in suppuration; and the matter thus produced being, in the course of circulation, carried to the heart, Mr. Hunter supposes that, in such cases, death may have been induced by that cause alone.

There can be no reason to doubt the fact held forth by Mr. Hunter, that in such instances the vein in which the orifice has been made, has frequently, after death, been found greatly inflamed: but however ingenious his arguments may be for concluding that the state of the vein is the original cause of all the bad symptoms enumerated, and although we must allow that such an inflammatory affection of a vein must have a considerable influence in aggravating the various symptoms previously induced by other causes; yet we may very fairly conclude, that it could not probably, in any one instance, be able to account with satisfaction for their first production.

In many instances the patient, at the very instant of the operation, feels a very unusual degree of pain. In some cases, the violence of the pain is almost insupportable. Now this we can never suppose to have been produced by the mere puncture of a vein; for although the coats of veins are not, perhaps, entirely destitute of feeling, yet we know well that they are not endowed with such a degree of sensibility as to render it probable such intense pain could ever be induced by their being punctured in any way whatever. This inflamed state of the veins, therefore, as detected by Mr. Hunter after death, must be considered rather as being produced by, than as being productive of, such affections; and that such ailments should frequently produce an inflammation of the contiguous veins, is a very probable conjecture. In the course of forty-eight hours or so from the

operation, when the febrile ſymptoms are juſt commencing, ſuch a degree of hardneſs and evident inflammation is induced over all the parts contiguous to the orifice, that it would be ſurpriſing indeed, if the vein, which is thus, perhaps, entirely ſurrounded with parts highly inflamed, ſhould eſcape altogether. We ſhall therefore proceed upon the ſuppoſition of this inflamed ſtate of the veins being a conſequence rather than the cauſe of ſuch ailments; and of courſe we now revert to one or other of the opinions long ago adopted on this ſubject, that all the train of bad ſymptoms found on ſome occaſions to ſucceed venefection, proceed either from the wound of a nerve or of a tendon.

That a partial wound of a nerve will now and then produce very diſtreſſing ſymptoms, no practitioner will deny: but it has been attempted to be ſhown, that tendons are almoſt totally deſtitute of ſenſibility; and it has, therefore, been ſuppoſed, that their being wounded can never account for the various ſymptoms known to occur in ſuch caſes. There is great reaſon, however, to think, that, in different inſtances, the ſame train of ſymptoms have been induced by different cauſes; that in one inſtance a wounded nerve, and in others pricks of the tendons, have occaſioned them, as we have already ſuppoſed.

We ſhall now deſcribe the method of curing the wound. In order to prevent, as much as poſſible, the conſequent inflammation and other ſymptoms which uſually enſue, a conſiderable quantity of blood ſhould be immediately diſcharged at the orifice juſt made: the limb, for ſeveral days at leaſt, ought to be kept in a ſtate of perfect reſt, care being at the ſame time taken to keep the muſcles of the part in as relaxed a ſtate as poſſible: the patient ſhould be kept cool; on a low diet; and, if neceſſary, gentle laxatives ought to be adminiſtered.

When, notwithſtanding theſe means, the ſymptoms, inſtead of diminiſhing, rather become more violent; if the lips of the orifice turn hard and more inflamed, if the pain becomes more conſiderable, and eſpecially if the ſwelling begins to ſpread, other remedies come then to be indicated. In this ſtate of the complaint, topical blood-letting, by means of leeches, applied as near as poſſible to the lips of the wound, frequently affords much relief; and when the pulſe is full and quick, it even becomes neceſſary to evacuate large quantities of blood, by opening a vein in ſome other part.

The external applications uſually employed in this ſtate of the complaint are warm emollient fomentations and poultices. In ſimilar affections of other parts, no remedies with which we are acquainted would probably be found more ſucceſsful, but in the complaint now under conſideration, all ſuch applications, inſtead of being productive of any advantage, rather do harm. The heat of the part is here one of the moſt diſtreſſing ſymptoms;

and warm emollient applications rather tend to augment this ſource of uneaſineſs. The lips of the wound, alſo, are rendered ſtill more hard, ſwelled, and of courſe more painful; and the ſwelling of the contiguous parts is increaſed. The beſt external remedies are cooling aſtringent applications. The parts chiefly affected being covered over with cloths, wet with very cold water, or a ſolution of vitriolated zinc, and Goulard's cerate on lint applied next the wound, are kept more cool and eaſy than by any other remedy. The febrile ſymptoms which occur muſt at the ſame time be attended to, by keeping the patient cool, on a low diet, preſerving a lax ſtate of the bowels; and, if neceſſary, farther quantities of blood ought to be evacuated.

On account of the violence of the pain, which is ſometimes ſo exceſſive as to deſtroy entirely the patient's reſt, opiates ought to be freely exhibited; and when twitchings of the tendons and other convulſive ſymptoms ſupervene, medicines of this kind become ſtill more neceſſary. In order, however, to have a proper influence in this ſtate of the complaint, opiates ought to be given in very full doſes; otherwiſe, inſtead of anſwering any good purpoſe, they conſtantly tend to aggravate the different ſymptoms, not only by increaſing the heat and reſtleſſneſs, but by having an evident influence in rendering the ſyſtem more ſuſceptible than it was before, of the pain and other diſtreſſing effects produced upon it by the wound.

It often happens, however, either from neglecting the wound or from improper treatment, that all theſe remedies are had recourſe to without any advantage whatever: the fever, pain, and ſwelling of the parts continuing, convulſive affections of the muſcles at laſt occur, all tending to indicate the moſt imminent danger. In this ſituation of things, if we have not immediate recourſe to ſome effectual means, the patient will ſoon fall a victim to the diſorder; and the only remedy from which much real advantage is to be expected, is a free and extenſive diviſion of the parts in which the orifice producing all the miſchief was at firſt made. We know well, from the repeated experience of ages, that much more pain and diſtreſs of every kind is uſually produced by the partial diviſion either of a nerve or of a tendon, than from any of thoſe parts being at once cut entirely acroſs. Now the intention of the operation here recommended, is to produce a complete diviſion of the nerve or tendon we ſuppoſe to have been wounded by the point of the lancet, and which we conſider as the ſole cauſe of all the ſubſequent diſtreſs.

This operation being attended with a good deal of pain, and being put in practice for the removal of ſymptoms from which it is, perhaps, difficult to perſuade the patient that much danger can occur, all the remedies we have mentioned ſhould be firſt made trial of before it is propoſed: but, at the ſame time, care ought

to be taken that the diſorder is not allowed to proceed too far before we have recourſe to it; for if the patient ſhould be previouſly much weakened by the feveriſh ſymptoms having continued violent for any length of time, neither this remedy, nor any other with which we are acquainted, would probably have much influence. So ſoon, therefore, as the courſe already preſcribed has been fairly tried, and is found to be inadequate to the effects expected from it, we ought immediately to have recourſe to a free diviſion of the parts chiefly affected, by which means the urgent ſymptoms will gradually ſubſide and the patient obtain a cure. By this operation we ſhould endeavour to divide the nerve entirely, by making a pretty deep inciſion in the fleſh a little above the wound made in blood-letting. There have been inſtances where the moſt violent ſymptoms have been ſuddenly relieved, by an inciſion acroſs the arm, and that not a very deep one. This ſhows evidently, that in theſe caſes, the malady has been occaſioned by the partial diviſion of a nerve. The difficulty of finding out the nerve ſo affected, however, renders this operation ſomewhat more difficult, and even dangerous, than it would otherwiſe be, and therefore the following directions for the performance of it will be neceſſary.

Having provided againſt any accident from the diviſion of the artery, by applying the tourniquet, make an inciſion in the external integuments, ſo large, that you are ſure the wounded nerve or tendon muſt be within it: Then gradually and cautiouſly make ſlight and ſhallow inciſions in the cellular and muſcular ſubſtance, until the wounded nerve is fairly cut through; taking all poſſible care to avoid the larger veins, arteries, and tendons. In this manner we muſt proceed, if the patient is not relieved ſooner, till we arrive at the periofteum itſelf. If the patient, even by this ſevere inciſion, finds no relief, the tendon next to the wounded vein muſt be divided alſo; but there is no inſtance on record where ſuch a diviſion has been neceſſary; and this renders it probable, that the ſymptoms which have been enumerated proceed moſt frequently, if not always, from the wound of a nerve.

Treatment of ruptured Tendons.

Wherever a *wounded or ruptured tendon* may be ſituated, the limb ſhould be placed in ſuch a manner as will moſt readily admit of the retracted ends of the tendon being brought nearly together; and when in this ſituation, the muſcles of the whole limb in which the injury has happened muſt be tied down with a roller, ſo as to prevent them from all kinds of exertion during the cure, endeavouring at the ſame time to keep the parts eaſy and relaxed. Thus, in a wound or rupture of the tendon of the rectus muſcle of the thigh, the patient's *leg* ſhould be kept as much as poſſible ſtretched out during the cure, while the thigh

ſhould be in ſome degree bent, to relax the muſcle itſelf as far as poſſible.

In ſimilar affections of the tendo Achillis, the *knee* ſhould be kept conſtantly bent, to relax the muſcles of the leg; and the foot ſhould be ſtretched out, to admit of the ends of the ruptured tendon being brought nearly into contact. A roller ſhould be applied with a firmneſs quite ſufficient for ſecuring the muſcles and tendons in this ſituation; but care muſt be taken to prevent it from impeding the circulation. With this view, fine ſoft flannel ſhould be preferred either to linen or cotton; for being more elaſtic, it more readily yields to any ſwelling with which the limb may be attacked.

The late Dr. Monro was the firſt who gave any accurate directions for the treatment of rupture in the large tendons, and it is perhaps given with more preciſion, from his having himſelf experienced the effects of this misfortune in the tendo Achillis.

He uſed a foot ſock or ſlipper, made of double-quilted ticking, and left open at the toe; from the heel of which a ſtrap went up above the calf of the leg. A ſtrong piece of the ſame materials went round the calf, and was faſtened with a lace. On the back-part of this was a buckle, through which the ſtrap of the foot-ſock was paſſed, by which the calf could be brought down, and the foot extended at pleaſure. Beſides, there was a piece of tin applied to the fore-part of the leg, to prevent the foot from getting into any improper poſture during ſleep. After propoſing to walk, he put on a ſhoe with a heel two inches deep; and it was not till the expiration of five months that he ventured to lay aſide the tin plate; and he continued the uſe of the high-heeled ſhoe for two years. The whole apparatus is repreſented in Plate IV. fig. 102.

From this treatment, a knowledge may be formed of the treatment neceſſary to be followed in the laceration of tendons of other parts of the body.

Wounds of the Thorax.

In treating on Wounds of the thorax, abdomen, and viſcera, we ſhall avail ourſelves of the very judicious remarks made by Mr. Latta, who has written with great and acknowledged ability on theſe ſubjects.

The cavity of the thorax, he obſerves, is much leſs deep in the fore than the back part, being enlarged, both behind and on each ſide, from the manner in which it is attached to the ribs, and firſt vertebræ of the loins. Any wound therefore paſſing either through the right or left ſide of the upper part of the abdomen, called the hypochondria, muſt, at the ſame time, enter the cavity of the thorax. The whole cavity, lined with a firm membrane, called the pleura, is alſo divided into two cavities, by the mediaſtinum, which is firmly attached to the ſternum throughout its whole length, run-

ſing acroſs the diaphragm, directly through the middle, and firmly attached in its back part to the ſpine. This membrane is formed by a duplicature of the pleura, which in the back part is reſolved into its two original laminæ, in order to allow a paſſage for the œſophagus and aorta aſcendens. The heart, ſurrounded by the pericardium, occupies a conſiderable part of the anterior and middle part of it, in the left ſide, lying nearly in a tranſverſe direction. The remainder of the left ſide of the thorax is filled with two lobes of the lungs; and the whole right ſide of it is filled with three lobes of the lungs, beſides the large blood veſſels, thoracic duct, and thymus. In a healthy ſtate of the body, the lungs are entirely detached from the pleura coſtalis; however, in a very high degree of inflammation, ſuch as in pleuriſy and peripneumony, adheſions frequently take place, and theſe are often not only very firm, but very extenſive.

The thorax is a part very liable to be wounded; and the wounds which are inflicted upon it are of four different kinds. 1. Thoſe which only divide the ſkin and cellular membrane, but neither penetrate the cavity, nor fracture the ribs or ſternum. 2. Thoſe which, beſides the ſkin, cellular ſubſtance, and muſcles, penetrate alſo the pleura, but without any injury to the lungs, or other thoracic viſcera. 3. Where not only the cavity is penetrated, but ſome of the viſcera are wounded. 4. Such as, penetrating the ſkin, cellular ſubſtance, and muſcles, fracture the ribs or ſternum, and then paſſing through the pleura, injure alſo the viſcera. Of each of theſe we ſhall treat in order.

1. Superficial wounds of the thorax, which only pierce the integuments, may eaſily be diſtinguiſhed from the others, by tracing the direction of the wound from its entrance to its exit, either by the fingers, or a large bougie, which is preferable to any metalline probe. In theſe no air can be drawn into the thorax during the time of inſpiration, nor expelled during expiration, ſo as to impede the motion of the lungs, as is the caſe with other wounds where the cavity is penetrated. Theſe wounds are ſeldom attended with any danger, and will always heal as eaſily as in any other part of the body. In ſuch wounds, we ought generally to enlarge the moſt dependent orifice for ſeveral inches, by which means the matter will always have a proper vent; and any extraneous bodies may eaſily be got out, or diſcharged along with the matter. In like manner, when the wound only paſſes through the ſkin and cellular membrane, without paſſing below any of the muſcles, and when the wound is not very extenſive, we ought at once to lay it open from one end to the other, by means of a probe-pointed biſtoury and a director, dreſſing it with mild ſoft dreſſings throughout the whole length, until it begin to granulate from the bottom. In the ſame way we are to treat inciſed wounds; and, as ſoon as the granulations are thoroughly formed over the whole ſurface, the ſides of it ought to be brought into

contact, and kept ſo by adheſive ſtraps. But it is obvious, that when any wound paſſes under the muſcles that cover the thorax, and has an exit at ſome diſtance from the entrance, no inciſion ought to be made, further than to enlarge the moſt dependent opening, to give vent to the matter, or any extraneous bodies that may be lodged in the wound. Many chirurgical writers have recommended the uſe of ſetons in wounds of this kind; but no prudent ſurgeon will venture to introduce a ſeton through the body of any muſcle; and, ſhould any one do ſo, he will ſoon be made ſenſible of the impropriety of his conduct, by the violent pain, inflammation, and tenſion, which muſt unavoidably enſue. Theſe ſymptoms, indeed, are commonly ſo ſevere, without the uſe of any ſeton, that it requires our utmoſt exertions to keep them within bounds. A ſeton, may, indeed, be uſed with ſucceſs in wounds which only penetrate the cellular ſubſtance, and where there is a probability that, by laying open the whole wound, we ſhould expoſe too great a ſurface. In caſes of this kind, we may conveniently diminiſh the ſize of the ſkain every day, when a full and free ſuppuration has taken place, as has already been directed; and thus the wound will be cicatrized in a very ſhort time. But where the muſcles are wounded, we muſt apply warm poultices, emollients, &c. in order to procure a free and plentiful ſuppuration. After this has continued for ſome time, and the pain diminiſhes, together with the inflammation and tenſion, and every extraneous body is certainly removed, we muſt dreſs both openings regularly with mild applications, putting above them a linen compreſs, of ſufficient length to cover the whole ſinus, and of the breadth of ſeveral inches, ſecuring the whole with a roller, four inches broad, put round the thorax pretty firmly; only not ſo as to affect the motion of the ribs, or cauſe any impediment in the patient's breathing. The roller muſt be ſupported by a ſcapulary put over the ſhoulders, and pinned to it wherever neceſſary.

In this way we may certainly cure every ſinuous ulcer which does not run very deep, where the patient is healthy, and the matter of a good conſiſtence, and where every ſymptom of inflammation has ſubſided, and the matter been diminiſhed in quantity. Where theſe circumſtances concur, it is probable that in a few days the wound will be completely healed, without the help of either tents or ſetons. But if the inflammatory ſymptoms ſhould run high, we muſt endeavour to allay them by blood-letting, general and topical, according to the ſtrength of the patient; and the regimen, both with reſpect to food and drink, muſt be of the antiphlogiſtic kind. Fruits and vegetables of all kinds may be given freely, and the bowels kept moderately open by ſome gentle laxative; but all animal food, as well as heating liquors, muſt be ſtrictly prohibited. Motion of every kind alſo muſt be avoided; and if a tickling cough ſhould come on, it muſt be allayed by opiate draughts.

2. *Wounds which penetrate the cavity* of the thorax, but wtihout any wound of the viſcera, though much more dangerous than the former, are leſs ſo than where the viſcera are likewiſe injured. They, however, require great care and attention on the part of the ſurgeon, during the courſe of their cure. But, before we proceed farther, it may be proper to remark, that the cavity of the thorax is always entirely full, whether the perſon inſpires or expires; nay, even after death, they continue to fill the cavity as completely as before. But when any ſmall wounds are made between the ribs, ſo as to penetrate the intercoſtal muſcles and pleura, by which means the air is admitted to the cavity of the thorax, then the lungs immediately collapſe on that ſide where the wound is, and the ſpace between them and the pleura is filled with air; but in ſuch caſes, it is evident that the wound can be but of ſmall extent; for if it pierces deep, it muſt reach ſome of the viſcera; and if it extend to any diſtance, either upward or downward, one of the ribs muſt of courſe be broken. The only way in which a wound of this kind can be inflicted, is by a ſmall ſword, or other pointed weapon; or poſſibly by a very ſmall piſtol bullet paſſing between the ribs, and ſtopping juſt when it has penetrated the cavity of the thorax. It may be known to have done ſo, by the ruſhing in of air by the wound during the time of inſpiration; or, if the wound is large, it may be examined by the fingers, which previous to this ought always to be dipped in olive oil. But if the wound be too ſmall to allow of ſuch examination, we muſt employ a bougie, well oiled, for the purpoſe, for metal probes ought never to be introduced into freſh wounds, eſpecially ſuch as penetrate the cavity of the thorax or abdomen. They ſhould never, indeed, be made uſe of in any caſe but with the utmoſt caution; and only where we expect to meet with carious bones, or with ſome hard and foreign ſubſtances.

3. Wounds of the cheſt extending to *the lungs* are known by the air ruſhing out through the wound on inſpiration, and entering the cavity of the thorax in the time of expiration. A conſiderable quantity of blood, generally mixed with air, flows out of the wound, and a quantity of blood of the ſame kind is expectorated by coughing; a great difficulty of breathing, and ſometimes emphyſema, being the concomitants of the other ſymptoms. Theſe wounds are always attended with great danger, 1. On account of the loſs of blood, which flows out in great quantity, as the whole blood of the body paſſes through the lungs. 2. From the number and ſize of the veſſels wounded; and the deeper the wound, the greater is the danger. and very often, indeed for the moſt part, ſuch injuries terminate fatally; and in all caſes where the patient is of a diſeaſed habit, or in the leaſt intemperate, we may venture to ſay that he will not ſurvive.

Indeed, in wounds of the lungs it is not uncommon for the patient inſtantly to ſink under the loſs of blood, and expire in a few minutes after the wound is received; or, if he does not, his

ſtrength is, for the moſt part, exhauſted by the formation of abſceſſes in different parts of the breaſt. Theſe bring on hectic fever, with copious ſweats in the night-time, particularly about the head, breaſt, and arms. A copious purulent diarrhœa likewiſe comes on, attended with twiſtings about the navel before each evacuation; and after theſe ſymptoms have continued for ſome time, the urine will be alſo found to depoſit a large quantity of pus, by all which the unhappy patient is at laſt deſtroyed. But in people of good habit, and who live temperately, there are inſtances of wounds in the breaſt having been cured where the cavity of the thorax has been quite penetrated from one ſide to the other; though the treatment has been the ſame.

In hemorrhagy from wounds of this kind, the only artery we can ſecure is the intercoſtal, which alſo may be injured by a ſimple fracture of the ribs, though the lungs be not wounded; and, on the other hand, it may not be wounded, though the ſubſtance of the lungs be injured. This artery is but ſmall, and it is ſometimes very difficult to ſtop the bleeding of it, on account of its running for ſome way in a ſmall groove in the bone. In order to ſtop the hæmorrhage, we muſt make a free external inciſion, by means of which we can have acceſs to the wounded veſſel; and, if the rib happens to be broken, we may thus alſo be enabled to remove any of the ſplinters. After the wounded part of the bleeding veſſel is brought into view, we muſt pull it out, by means of the tenaculum, endeavouring to puſh the point of the inſtrument between the rib and artery, piercing at laſt both ſides of the veſſel with it, which will enable us to ſeparate it from the bone and tie it up in the uſual manner. Inſtead of uſing the tenaculum, however, we may ſtop the bleeding with the fine powder of agaric; and having afterwards removed every extraneous body, and evacuated, as far as poſſible, the blood which has flowed into the cavity of the thorax, we muſt cover up, not only the wounded part of the artery with ſmall doſſils of lint, but the ſides of the wound muſt be brought together, and covered with a plaſter ſpread with any mild ointment ſo completely, that no air can have acceſs to the cavity of the thorax. In order to prevent the difficulty of breathing and anxiety that always take place, in caſes of this kind, the patient muſt be deſired to make an heavy and full inſpiration; and, as ſoon as this is done, the ſkin muſt be brought over the wound, ſo as to cover it completely, if poſſible, during the time of expiration; and, by repeated trials of this kind, the air will at laſt be expelled from the cavity of the thorax. After this, the wound muſt be exactly cloſed, by bringing the lips of it into contact, and ſecuring them in that poſition by ſlips of adheſive plaſter. The whole muſt afterwards be ſupported by a broad bandage of linen, put ſeveral times round the body, and retained in their places by a ſcapulary. Every degree of attention muſt be paid to prevent the admiſſion of air, the formation of mat-

ter, the lodgment of blood, ſerum, &c. which very frequently take place in wounds of the thorax; for theſe never fail to produce anxiety, difficult breathing, and other alarming and dangerous ſymptoms. That this may be accompliſhed, the patient ought to be laid on a bed, in ſuch a poſture, that the wound may be the moſt dependent part of the cheſt; and in order to do this, we muſt elevate the under part of the body, when the wound is in the upper part of the cheſt, or near the middle, and depreſs it when the lower part is wounded; and thus we may eaſily avoid any collection of extravaſated blood in the cavity of the thorax; and, if the ſurgeon be careful, at every dreſſing, to evacuate any quantity of matter that may be there, and to prevent the admiſſion of air into the thorax, there will never be any occaſion for making any other opening than that of the wound itſelf. Openings in this part of the body, indeed, even though made with the utmoſt caution, are always attended with great danger; being nothing elſe than making new wounds, each of which may be productive of all the bad conſequences of the others; and, therefore, we ought to uſe every endeavour to evacuate the blood, or matter, by putting the body in the poſture already deſcribed. It is neceſſary to the cure of this kind of wounds, that the patient be kept very quiet, and the inflammatory ſymptoms ſubdued by plentiful blood-letting, a cooling diet, and antiphlogiſtic regimen. The drink ought not only to be of the cooling kind, but alſo mucilaginous, and the belly ought to be kept regularly open by mild purgatives. The cough and reſtleſſneſs muſt be appeaſed by opiates; and thus, if the injury has not been ſo great that the vital powers cannot repair it, the patient will at laſt get free from all his complaints, and the wound will heal up; but we muſt never allow it to heal, whilſt a particle of extravaſated blood or other extraneous matter remains.

3. Where *the wound paſſes into the lungs*, the diſcharge of blood, both by the mouth and the orifice of the wound, will not ceaſe on the tying up, or otherwiſe ſtopping the flux from the intercoſtal artery; for, as all the blood of the body paſſes through the lungs, it is evident, that even the ſmalleſt veſſels of that part, when ruptured, muſt bleed very impetuouſly; and, if many of them are deſtroyed at once, the patient muſt inevitably die. The only way in which the diſcharge from the lungs can be mitigated, is by copious blood-letting frequently repeated, and by keeping the patient as cool as poſſible. If it is the ſummer ſeaſon, all the windows of his apartment muſt be kept open; his food ought to be of the lighteſt and moſt cooling kind; and, if it is the ſeaſon of ripe fruits, he ought to uſe them freely. In other ſeaſons of the year, he muſt live moſtly upon boiled or baked fruits, but ought ſeldom to taſte of the paſte in which they are baked; and, it is almoſt unneceſſary to mention, that the ſtricteſt attention muſt be paid to quietneſs on the part of the patient, and that any diſturb-

ance, either of body or mind, muſt be carefully avoided. Coughing muſt be avoided, and ſuch medicines exhibited as are calculated to prevent it. The moſt proper for this purpoſe are thoſe compoſed of opium, joined with ſome mucilage of gum-arabic, or any other ſoftening pectoral. He muſt not be allowed to ſpeak; and every method muſt be uſed to place the patient ſo that the wound may be the moſt dependent part of the body; and thus any collection of matter or blood, that may be formed between the pleura and lungs, or in the lungs themſelves when wounded, will generally be evacuated through the aperture.

As the greateſt danger attends wounds of this kind, it is plain that the utmoſt caution muſt be uſed in dreſſing them. At every time the dreſſings are taken off, we muſt endeavour to evacuate any blood that may have collected during the interval; and, as it muſt always be uncertain whether a large or ſmall quantity has been collected in any given time, it is alſo evident that no rule can be laid down for the frequency of dreſſing. The only way by which we can regulate our conduct in this matter, is by the quantity of matter diſcharged at each time, and the relief that is thereby given; and therefore, when the breathing again becomes very difficult, and the patient greatly diſtreſſed, we muſt again give relief by dreſſing the wound and evacuating the fluid. By carefully attending to this, as well as to every other thing which may occur in wounds of this kind, the diſcharge, in an healthy, young ſubject, will ſoon begin to diminiſh, the wound in the ſubſtance of the lungs will alſo begin to heal, and will at laſt cicatriſe. In general, however, in all wounds of the lungs, ſlight adheſions take place betwixt them and the pleura; particularly if due care has been taken to evacuate the matter as faſt as it was collected; and by means of this adheſion we may eaſily obſerve, whether the wound in the lungs heals up properly or not. When we find that the internal wound is completely healed, we ought next to promote the cure of the external one, by drawing it together as much as we can; and, unleſs in very extraordinary caſes, we need not doubt of its ſoon cicatrizing in like manner.

The beſt way of evacuating any collection of blood or matter which may take place in the cavity of the cheſt from internal cauſes, will be noticed when we ſpeak of *paracenteſis of the thorax*. We ſhall now conſider the proper mode of treatment to be obſerved in thoſe abſceſſes of the lungs called by phyſicians *vomicæ*. Theſe are collections of matter formed in the ſubſtance of the lungs themſelves, but without any opening, either external or internal, ſo that the matter can neither be diſcharged by the mouth, or through any external opening of the integument, nor even into the cavity of the thorax, till they become at times very large. The firſt ſymptoms of a vomica are coldneſs and ſhivering, attended with great debility, particularly in the lower extremities. A ſlight cough comes on, attended with ſome pain in

one of the ſides. This pain, in general, is at firſt confined to a particular ſpot, ſo well defined, that the patient can point it out with his finger. The coldneſs and ſhivering are by degrees ſucceeded by heat, reſtleſſneſs, and a troubleſome cough, attended with a conſiderable pain on every inſpiration. During this ſtage of the diſeaſe, we muſt attempt the patient's relief by general blood-letting; and if this does not anſwer the purpoſe, recourſe muſt be had to cupping, with ſcarification. We ought alſo to apply bliſters frequently; and endeavour, by ſoft pectorals, in which the tincture of opium forms a conſiderable part of the compoſition, to allay the cough. The following is recommended by Mr. Latta:

(No. 1.) ℞ Mucilag. gum. Arab. ℥ iv.
Aq. cinnamom. ℥ iſs.
Succ. limon. ʒ iij.
Syr. commun. ℥ v.
Aq. fontan. ℥ iſs.
Tinct. Opii. gtt LXXX. *Miſce.*

A tableſpoonful of this may be ſlowly ſwallowed at any time when the cough is troubleſome, and will generally prove uſeful.

In theſe caſes the pulſe is always very quick, ſeldom leſs than 120 in a minute; and if the other ſymptoms increaſe, particularly the teazing cough, attended with the fixed pain in that particular part of the cheſt, we are certain either that the patient is in a confirmed *phthiſis*, or that a *vomica* is forming. The ſign of a confirmed phthiſis is, when the pain is more largely diffuſed over the cavity of the cheſt, and the cough moſt ſevere about two o'clock in the morning; whilſt, at the ſame time, the expectoration falls to the bottom of a baſon with water: and it differs from the vomica in this, that the matter is not collected into one bag, but diſperſed in ſeveral ſmall abſceſſes like ſuppurated glands; and which indeed they really appear to be, for on comparing them with the glands of the meſentery when ſcrophulous, and in a ſtate of ſuppuration, no difference can be obſerved between them. The vomica, on the other hand, is only an *abſceſs in the lungs*, confined to a particular ſpot, marked by a conſtant fixed pain, ſimilar to thoſe collections in other parts of the body.

If the vomica, fortunately, ſhould break into the bronchiæ, a vaſt quantity of matter will be evacuated by the mouth, not without danger of ſuffocation to the patient; but if he eſcape this firſt danger, all the matter in the abſceſs will by degrees be ſpit up, and the ſore will heal, as in other parts of the body. During all the time that this is going on, however, the patient muſt be kept extremely quiet; he muſt not be allowed to ſpeak, and his food muſt be light, and eaſy of digeſtion; the cough muſt be kept under by anodynes, and the room ought to be rather

cool than otherwiſe. As ſoon as his ſtrength will permit, he ought to take ſome exerciſe in a chaiſe; and when his expectoration is conſiderably diminiſhed, as well as his ſtrength increaſed, he may then remove to ſome part of the country where the air is ſalubrious and temperate, until he perfectly recovers.

In this way Mr. Latta ſucceſsfully treated five people, each of whom had a large vomica, as appeared by the quantity of matter they ſpit up; and in four months from the firſt evacuation they were perfectly cured, and have continued to enjoy an uninterrupted ſtate of health ever ſince. But in ſome others which fell under his care, the termination was leſs favourable. Three of thoſe were ſuffocated by the immenſe quantity of matter contained in the vomica, and expired inſtantly on its burſting. In another he performed the operation for the empyema, and thus ſaved the patient. "From the obſervations I have made upon theſe four (ſays he), during the time that the abſceſs was forming, I think we might form ſuch a prognoſis as would enable us to avoid the danger of ſuffocation, by allowing them to burſt of themſelves, and ſave the patient. The three who expired inſtantly upon the burſting of the cyſt, had laboured under ſymptoms of a vomica for more than ſix months, in ſpite of every endeavour to allay them. After the ſymptoms of a complete formation of matter had taken place, it appeared evident to me, that, for a long time, the abſceſs continued to increaſe before it burſt. This was indicated by the following ſigns: 1. By the ceſſation of the acute pain in the ſide. 2. The regular return of ſhivering fits, twice in twenty-four hours. 3. The increaſe and ſpreading of the dull pain. 4. The cough becoming more and more troubleſome on the ſmalleſt motion; and, 5. From an uncommon degree of oppreſſion in the ſide where the pain was ſeated, and which conſtantly increaſed as the abſceſs ſeemed to increaſe. At laſt the lobes of the lungs, in which the abſceſs was, ſeemed to be almoſt entirely conſumed and formed into purulent matter.

"In theſe three patients, it was remarkable, that all of them were able not only to ſit up, but even to walk about their rooms, till juſt before the fatal moment, when the abſceſs burſt. Their complaints, during the whole time, were tolerable, except when attacked by ſevere fits of coughing. One of them, a ſeal engraver, and a man of great perſonal ſtrength, followed his buſineſs, though frequently adviſed to the contrary, till the very moment of his death. All of them were generally affected with a ſevere fit of coughing in the morning, upon ſitting up in bed, and in one of theſe this gentleman expired. For three weeks before his death, he, as well as the others, had been ſo weak, that he could not walk more than twice acroſs his room at a time; but notwithſtanding this, as his buſineſs kept him conſtantly in a ſitting poſture, he continued to work till he died, as has been already ob-

ſerved. On opening his body after death, a large abſceſs was found, which had burſt into the bronchiæ, and diſcharged ſuch a quantity of matter as to fill the trachea completely. It occupied moſt of the left lobe of the lungs, particularly the under and back part of it. He had often diſtinctly marked on the outſide the place where the pain was moſt ſevere; and here I found the abſceſs very thin, and only covered by the pleura, which indeed was a little thicker than ordinary. All around this, both above and below, the matter ſeemed to have waſted the ſubſtance of the lobe, until at laſt it had penetrated deep enough to erode ſome of the large branches of the bronchiæ, and thus diſcharged itſelf, at once, in ſuch a quantity, as to fill the trachea, and ſuffocate the patient. The place he had pointed out during his life-time as the ſeat of the pain, and where I afterwards found the abſceſs thinneſt, was about two inches nearer the ſpine than the left breaſt, directly in the ſpace between the latiſſimus dorſi and the pectoral muſcle; and here it is evident that the abſceſs might have been ſafely opened, ſo as to diſcharge the matter externally. In one of the other caſes the abſceſs occupied the lower part of the undermoſt lobe, on the left ſide, and the pain had its ſeat rather forward, and about two inches below the part where the point of the heart is felt to ſtrike on the ſide. The abſceſs was alſo very large and thin towards the ribs; but had likewiſe penetrated ſo deep into the ſubſtance of the lobe, as to erode the bronchial veſſels, and thus, by the quantity of the diſcharge, to ſuffocate the patient in an inſtant.

"In the third patient, the abſceſs was ſeated in the middle lobe of the right ſide, and the pain was ſeated about the middle of the thorax, at about an equal diſtance from the ſternum and ſpine. The abſceſs, in this caſe, was alſo very large, and had deſtroyed a conſiderable part of the lobe; the pleura being ſtill almoſt the only part that kept the matter from flowing out into the cavity of the thorax. In none of the three caſes did the pleura adhere to that part of it which lines the ribs; but, from the extreme thinneſs of that part of the abſceſs which lay next the ribs, it was evident, that had an opening been made in the centre of the place where the pain was felt, and a trocar been puſhed into the ſubſtance of the lungs, we could not have failed to evacuate the matter to the relief of the patient, for a time at leaſt, by ſecuring the canula in its place, fitting it with a cork, and carefully preventing the admiſſion of air into the cavity of the thorax; while, at the ſame time we allowed a free vent to the matter, we had alſo a great chance of affecting a radical cure: but though in theſe three caſes I uſed every argument I could think of with my patients to allow me to give them this laſt and only chance for their lives, I could not prevail upon them to ſubmit to it.

"The fourth caſe, where the patient recovered, was not at-

tended with more favourable ſymptoms than in thoſe who died. For ſix months he had laboured under ſymptoms of a vomica in the inferior lobe of the lungs on the right ſide; and having had the good fortune to perſuade him of the danger he was in, and of the neceſſity of performing an operation for evacuating the matter, he chearfully agreed to ſubmit to it. He was then laid upon a table on his back, with the right ſide turned towards a clear light; an hair mattreſs being put under him that he might lie the more eaſily. That the proper place in which to make the perforation might be diſcovered, his right ſide was a little raiſed, and ſupported by pillows, one below the ſhoulder, and another below the haunch. Having ſecured him in this poſition, I made an inciſion between the two firſt falſe ribs, nearly at an equal diſtance from the ſpine and enſiform cartilage, about two inches in length. Having divided the ſkin and cellular ſubſtance at one ſtroke of the ſcalpel, I continued the inciſion through the ſerratus muſcle alſo for about the ſame ſpace; after which, I cautiouſly divided the intercoſtal muſcle, continuing the inciſion down to the pleura. Feeling this membrane very tenſe, and being unwilling to admit air into the cavity of the thorax, I did not perforate the pleura with a lancet, but introduced a trocar of a flat ſhape, and *deeply grooved*, ſo as to allow the matter to paſs along it as ſoon as I ſhould penetrate the abſceſs. Having puſhed the inſtrument a little more than half an inch through the pleura, the matter began to flow freely through the groove; on which, withdrawing the ſtilette, I puſhed the canula about an inch farther, without any pain to the patient; and, as the matter ſtill continued to flow copiouſly, I ſoon drew off about a pound of it, of the colour and conſiſtence of thick yellow cream. I then ſtopped the flow of the matter, by putting a cork in the canula; and ſecured it in its place by means of a piece of tape put round the cheſt, and over each ſhoulder. The ſides of the wound were then drawn as cloſe to the canula as poſſible, by means of adheſive ſtraps, and the patient was covered up where he lay, for ſix hours; after which I took out the cork, and again allowed ſix ounces of matter of the ſame kind to flow out. By theſe evacuations the patient found his breathing much relieved, and the pain diminiſhed; and during the night he ſlept better than he had done for many days before.

"During the firſt four days, I drew off about 12 ounces of matter, morning and evening, but never drew off the whole at once. For this I had two reaſons: 1. That I might prevent, in ſome degree, too great a dilatation of the veſſels of the lungs by reaſon of the preſſure of the matter being taken off from them; and, 2. To prevent, in the moſt effectual manner, the admiſſion of air into the cavity of the thorax. By perſevering in a ſtrict regimen, the patient's health continued to amend daily, and the

discharge of matter gradually to diminish, so that in three months from the time of the operation the internal abscess was completely healed, and the external wound entirely filled up.

The canula employed was one perforated with large holes on each side to within an inch of the top. Hence the matter could enter the tube in every direction; and, from its being furnished with an oval head, convex to the intercostal muscles, and concave on the outer part, it was impossible for it to fall into the cavity of the thorax. The flat side being next to the ribs, it might be pushed up to the very head, without any danger to the patient. The introduction of one of these canulas will, doubtless, not only prevent the wound from closing, but give a free discharge to the matter as fast as it is formed. Abscess in the lungs is not a necessary consequence of their being wounded, but arises from the external orifice of the wound not keeping open until the matter is discharged, and the whole sinus in the lungs completely filled up. Where this is not the case, matter collects in that part of the internal wound which was not completely healed up. By degrees this increases; and we know that it does so by the increase of cough, difficulty of breathing, and pain in the side, immediately under the cicatrix of the old wound; and both these symptoms are constantly augmented by lying upon the opposite side. Frequent rigors take place, with exacerbations morning and evening, quick pulse, and hectic sweats. These symptoms fully show that matter has been formed a second time; and the quantity of it will always be in some measure indicated by the violence of the symptoms, and the length of time it has been in collecting. In such cases, the patient must evidently be in great danger; and this danger can only be removed by making a fresh opening, and allowing the matter to discharge itself. For this purpose, an incision is to be made in the integuments, of about two inches long, continuing it down through the intercostal muscles to the pleura, and the trocar just described passed into the abscess, which will be known by the discharge of the matter along the groove.

When circumstances, however, demand an operation of this kind, we must not discharge *all the matter at once*. It ought always to be evacuated by degrees, to prevent the too great expansion of the vessels, after the pressure of the matter is taken off. It is evident, that, for the purpose of evacuating the matter, no *tents* can ever be as useful as the canula we have recommended; for, when this is used, we may easily prevent any quantity of air from entering the cavity of the thorax, which is always found to be pernicious when admitted into any of the cavities of the body. On the contrary, when we make use of a tent in any wound, the air must certainly have admission. It is evidently impossible that we can cure a wound of any depth without some contrivance to

prevent the parts from healing externally before the cavity is filled up. In gunſhot wounds, particularly in the ſternum, it is abſolutely neceſſary, in order to extract all foreign ſubſtances, to take out one or more pieces of the bone by means of a large trepan; by which means we alſo give vent to whatever quantity of matter is afterwards formed. When this is done (which is to be accompliſhed in the ſame manner as in trepanning the cranium), the wound ought to be carefully covered up from the air, and the patient placed in ſuch a manner as to make the wound the moſt dependent part of the cheſt, by which means all the blood, ſerum, &c. extravaſated in the cavity of the thorax, will find a ready outlet.

Wounds of the Abdomen.

If *wounds of the teguments and muſcles of the abdomen* happen to be ſufficiently large to admit the finger, we can exactly determine their depth; and as this cavity, as well as the thorax, is always quite filled, we may always know by the protruſion of ſome part of the bowels, whether the cavity be penetrated or not. We may alſo judge pretty well of the depth of the wound, from the direction in which it was inflicted. It is not common for any great hæmorrhage to enſue from wounds which only affect the integuments of the abdomen, as the only artery of any conſequence in theſe parts is the epigaſtric, which runs upon the interior and lateral parts of the abdomen, parallel to the rectus muſcle. If this veſſel happens to be divided, we muſt take it up as quickly as poſſible by the tenaculum; and, if we are certain that the wound has not perforated the cavity, we muſt inſtantly bring the ſides of it together by ſutures, or by means of adheſive ſtraps; and keep them in that poſition till it be completely cicatrized. But if the wound is of conſiderable extent, and the muſcles alſo divided, we muſt take as much care as poſſible to prevent the patient from moving his body, leſt ſome of the bowels ſhould be forced out through the wound along with the peritonæum; for this membrane is extremely dilatable, and may be extended to ſuch a degree as to allow almoſt all the contents of the abdomen to protrude, without there happening any rupture of its own ſubſtance.

This inconvenience indeed is very liable to happen, unleſs great care be taken, both by the patient and ſurgeon. The proper method of avoiding it is by ſupporting the muſcles during the whole of the cure, by means of a ſtrong flannel bandage put twice or thrice round the body. The inflammation muſt be kept down by all poſſible methods, and the antiphlogiſtic plan rigidly employed.

It is very poſſible in wounds of the abdomen, as in thoſe of the

thorax, that the cavity may be juſt penetrated, without injury to any of the viſcera; and there are indeed many inſtances where the integuments of this cavity have been laid open for a conſiderable way, without any wound in the bowels; and the ſame thing alſo may happen in wounds of ſmaller extent. The danger in thoſe wounds ariſes not from the injury done to the integuments, but from the acceſs of the external air, which always raiſes a violent inflammation, when it has acceſs to any of the cavities of the body. Hence it is no uncommon thing for wounds which penetrate the abdomen to put on no dangerous appearances at firſt, and yet often terminate fatally. The danger of ſuch wounds, however, may ariſe, not only from the acceſs of external air, but from bad management of the external wound. It may proceed from a neglect of cloſing up the wound, ſo as to keep the air immediately out of the cavity. This muſt be done in wounds of ſmall extent, by drawing together the ſides by means of adhefive plaſters, and then covering the wound with pledgets of caddice, dipped in *Wade's balſam*, which will ſo effectually exclude the air, that the bowels cannot be any-way affected. But ſhould they, before the ſurgeon has an opportunity of doing this, happen to be affected by the air admitted during the time of inflicting the injury, or immediately after, we muſt endeavour to remove the inflammation by a diligent application of all the medicines proper for the purpoſe, and which have been enumerated under the heads of inflammation and hernia. In caſes of this kind, repeated and large blood-lettings, and bladders filled with warm water, and applied to the belly, are particularly uſeful. Emollient injections are likewiſe uſeful; and, after the inflammatory ſymptoms have been in ſome meaſure overcome, we may adminiſter anodyne clyſters with the greateſt advantage. Thus every inflammation affecting the ſurface of the inteſtines may, with proper perſeverance, be ſubdued; and it is evident from the ſymptoms attending the enteritis, or inflammation of the inteſtines, where it terminates in ſuppuration and death, that the matter is collected only in very ſmall quantities on the ſurface of the ſmall guts, forming a kind of inflammatory cruſt upon them; which even glues the different portions of the gut to one another, though no collection of any conſequence is ever made within the cavity of the belly.

The inflammation thus excited ſeldom terminates in large abſceſſes, but in what are called ſerous exſudations, which, on the ſurface of the inteſtines, appear like matter; inducing death only by the adheſions which take place through all the convolutions of the guts, producing a tendency to mortification at the ſame time. In all wounds, therefore, which penetrate the cavity of the abdomen, our firſt care muſt be, after having tied up any veſſel which bleeds to a conſiderable degree, to bring the edges of the wound as

close together as possible, and retain them in that position by means of the twisted or interrupted sutures. Having provided several long and flat threads, well waxed, with a needle upon each end, and having threaded as many needles as we think necessary, the patient is to be laid upon his back, with the breech and shoulders somewhat raised, so that we may relax, as much possible, all the muscles. The protruded intestines are then to be reduced; the surgeon is to introduce the forefinger of the right hand about half an inch within the wound. He then introduces the point of the needle immediately on the outside of the peritonæum, pushing it forward between that membrane and the muscles, for about three quarters of an inch from the external edge of the wound. Having thus carefully introduced all the ligatures, both on the one side of the wound and the other, he must cause the assistant to support the sides of it in close contact with each other, while the surgeon ties each ligature with a running knot, through the whole extent of the wound, keeping about three quarters of an inch between the stitches; after which, a large pledget, spread with emollient ointment, is to be laid over the whole wound, keeping the parts all firm by means of a bandage of thin flannel.

The patient must now be put to bed, and kept very quiet; his food must be of the lightest kind, and the inflammatory symptoms relieved, as soon as they occur, by blood-letting, and other proper methods. Indeed, in cases of this kind, almost the whole cure depends upon blood-letting, used in a judicious manner; but where the wound is very small, it will generally be sufficient to draw it together by adhesive straps; particularly if we apply a roller over the whole; the proper methods for preventing inflammation being had recourse to.

It has been said that, in wounds of this kind, the symptoms sometimes terminate in large collections of matter within the abdomen, and that, in such cases, the matter lies very deep. But this we apprehend occurs but seldom; collections of matter, apparently in the abdomen, being generally connected with the kidney, liver, or some other viscus, and at last breaking outwardly.

Another and more dangerous species of this kind of wounds is where the cavity of the abdomen is penetrated, and *part of the contents have protruded* through the wound. When this happens, the danger is generally in proportion to the time the bowels have been exposed to the air; for which reason, we must return the protruded parts as quickly as possible. Care must be taken, however, that they be not soiled with any filth or heterogeneous matter; and to avoid this, we must wash them with warm milk, or with warm water, if there be no milk at hand. This being done, the patient must be laid upon his back, in such a position, that all the muscles of the abdomen may be relaxed, by which the return of

the inteſtines will be facilitated; but, if they ſhould ſtill be found to protrude, we muſt endeavour to return that part which lies neareſt the wound; and, as ſoon as any portion begins to go back, the whole will follow in a very ſhort time. No farther enlargement of the wound will generally be found neceſſary; but, if it unexpectedly ſhould, the under part of the wound may eaſily be enlarged, and then the bowels being laid hold of with a warm moiſt cloth, the aſſiſtant is to pull them gently upwards towards himſelf, till the under part of the wound comes fairly within the view of the operator. The latter ought now to begin, by dividing the ſkin, cellular ſubſtance, and muſcles, down to the peritonæum. This membrane may now be very eaſily ſtretched; but it will be better to divide it with a probe-pointed biſtoury, introduced for about an inch along the finger, or juſt as much as will allow the bowels to return of their own accord; after which we muſt bring the ſides of the wound together by the interrupted ſuture, and then dreſs the wound in ſuch a way as to exclude the air. The parts will unite as in other wounds, and the ligatures may generally be taken out in five or ſix days; but, as the bowels will ſtill be liable to protrude, and to form hernias, it will be found neceſſary to compreſs the weak part for ſome time longer, by means of a flannel roller, and the utmoſt care muſt be taken to prevent any pain or inflammation from taking place in the belly; but, as this cannot always be entirely prevented, we muſt remember that, if a conſiderable tenſion comes on, it will be better to unlooſe the ſtitches, and to allow the wound to open a little, than to riſk worſe conſequences. The ſame medical treatment muſt be uſed here as in inflammation, viz. bleeding, gentle laxatives, and fomentations, together with an antiphlogiſtic regimen and diluting drinks.

Wounds of the Abdominal Viſcera.

It is a fact well known to ſurgeons, that even the ſmalleſt wounds inflicted on the abdominal viſcera are extremely dangerous. Thoſe of the alimentary canal are diſcovered by the fœtid ſmell which they emit, and by an effuſion of the contents of that part which is wounded, and which muſt evidently be very different, as the wound happens to be in the ſtomach, the ſmall or the great inteſtines. Beſides this diſcharge of the wounded part through the orifice, there is alſo a diſcharge of blood by the anus; the patient is affected with moſt violent gripes, ſevere ſickneſs and naufea, with extreme pain through the whole region of the abdomen; and theſe are ſucceeded by cold ſweats, hiccup, and faintings, which commonly end in the death of the patient.

In this kind of wounds, and eſpecially thoſe of the inteſtines, it would be of great ſervice to aſcertain the extent of the wound; but this cannot be done, unleſs the wounded parts protrude. In many

caſes, however, we are certain that, though the inteſtines have been wounded, yet the patients have perfectly recovered, though the wound was never ſeen. But, when the wounded gut happens to be protruded, we ought not by any means to replace it, until we have done every thing to prevent the effuſion of the fæces into the cavity of the abdomen; and this is moſt effectually done by ſome kind of future; and the one moſt commonly employed is that called the *glover's future*, and which, indeed, ſeems to be the beſt of all that have yet been propoſed. The moſt proper method of performing it is with a fine round needle threaded with ſilk. The ſurgeon having brought the lips of the wound exactly into contact with each other, muſt perforate both while in that poſition, introducing the needle into the gut about one-twelfth of an inch from the edge of the wound on one ſide, and bringing it out at the ſame diſtance on the other. Having thus made one ſtitch, he is to bring the needle with the thread acroſs the wound, and make a ſecond in the ſame manner; and ſo on, until a ſufficient number are made to keep the ſides of the wound together throughout its whole length, leaving a ſufficient length of thread hanging out at the orifice, to draw it all out when the wound in the inteſtine is healed. Thus the wound will heal without any contraction of the inteſtine; and there is not any neceſſity for entering the needle always from the inſide of the gut, as ſome have adviſed, which it certainly muſt be much more difficult and awkward for the ſurgeon to perform, than in the other way. Neither can there, as ſome have pretended, be any danger in allowing the thread to hang out at the wound, as it can always be withdrawn when the wound is healed; but we cannot ſay what might be the conſequence of leaving two or three inches of thread lying looſe in the cavity of the abdomen. In curing wounds of this kind, the thread ought always to be left hanging out of the orifice, ſo that we may take it away at pleaſure. In extenſive wounds of the inteſtines alſo, where there is reaſon to fear that, notwithſtanding the future, the wound may burſt open, we ought to keep the wounded gut in contact with the orifice in the peritonæum, until all danger of that accident be at an end.

In treating wounds in the inteſtines by future, we ought to ſtitch every divided part, if poſſible; but, if the gut be completely divided, and both ends hang out of the wound, we muſt bring the divided parts together, and keep them ſo, until they unite completely, which ought to be done with as little handling and expoſure to the air as poſſible; and to anſwer this intention as well as we can, it will be proper to ſtitch each end of the divided gut to the peritonæum on that ſide to which it belongs. Thus it is evident that, for ſome time, the fæces muſt be diſcharged by the wound; but there are many inſtances where the operation has perfectly ſucceeded, by the union of the divided ends of the gut; the fæces being diſcharged in the natural way, and the external wound in the abdomen

healing up entirely. The dreſſings, in caſes of this kind, ought to be very light, ſo as to leave the wound completely open at that part where the gut is ſtitched. Dry lint ought to be employed, covered with ſeveral folds of linen, with a flannel bandage over all. No certain time for dreſſing can be ſpecified, it being only neceſſary that the patient be kept regularly clean, and by this we are to regulate the times of dreſſing. Where this method was followed, caſes have occurred in which patients have recovered in ſix, nine, or ten months; all of them, indeed, in caſes of hernia, where gangrene had come on, ſo that ſuch treatment as has been deſcribed was indiſpenſable.

Other means may poſſibly ſucceed, where the inteſtine is fairly divided, particularly by inſinuating the upper end of the gut into the lower end, and retaining them there by a ſtitch. In caſes of this kind we ought to diſtinguiſh carefully between the upper and under parts of the gut, which is eaſily done, as the fæces will always be found puſhed out from the upper part in a few minutes, by the periſtaltic motion of the inteſtines. As it is difficult, however, to make ſtitches here in a proper manner, ſome practitioners have recommended to inſert a round ſubſtance into the cavity of the inteſtine. A ring of paſteboard has been recommended; but the propriety of this ſeems doubtful, ſince paſteboard is inſoluble in the body. A roll of tallow has likewiſe been recommended, and with more propriety; yet, poſſibly, by melting iſinglaſs in milk, making it of ſuch a conſiſtence as to reſiſt conſiderably, we might form it into a cylindrical tube, rather ſmaller than the internal diameter of the ſmall inteſtines, ſo that it might be eaſily introduced within the gut, the ſides being at leaſt one-eighth of an inch thick. As this ſubſtance is perfectly ſoluble in warm moiſt fluids, it is evident that, by the conſtant attrition of the inteſtinal canal upon it, and the warm vapour and moiſture which conſtantly have acceſs to it, it muſt in time be entirely diſſolved, while the circulation would not be in the leaſt impeded during the cure. Neither is there any danger from obſtruction in this caſe, as the contents of the inteſtines would eaſily be protruded through the hollow of the cylinder. The hardneſs of this ſubſtance would not be greater than tallow; and, as it inclined to melt, would gradually become ſofter. This cylindrical tube might conveniently be made three inches long, and, one half of it being inſerted into each end of the gut, a paſſage would be left for the excrements through its centre.

If, in a caſe of this kind, either end of the gut ſhould accidentally return into the cavity of the abdomen, we are adviſed to ſtitch to the peritonæum that part of the gut which remains out of the cavity; and, if this happen to be the upper part, and the wound be ſituated pretty far down, we have it thus in our power to form an artificial anus; and the patient may recover, though not indeed without a very great inconvenience remaining through life. But,

if the upper part of the divided inteſtine happen to ſlip into the abdomen, it is evident that the patient muſt inevitably die, becauſe it is impoſſible to prevent the contents of the inteſtines from being diſcharged into the cavity of the abdomen. To prevent, if poſſible, theſe fatal effects, it is the part of a ſkilful ſurgeon to put the patient in a proper poſition, and then, by laying open the wound, to find out that part of the inteſtine which has ſlipped into the cavity. After this is done, he muſt endeavour to unite the divided parts of the inteſtine by means of the hollow cylinder, as already related. Should it be the under end of the inteſtine, however, which is loſt, he ought not to attempt to perform this operation before the patient himſelf has agreed to ſubmit to the inconvenience of an artificial anus through life, or whether he would, in order to have the fæces paſs in the natural way, ſubmit to an operation, with barely a poſſible chance of recovery. Not only wounds of the inteſtines made by a ſharp inſtrument, but ſuch diviſions of them alſo as happen naturally in conſequence of mortifications, amongſt which we may rank ſtrangulated hernias, &c. require a treatment ſimilar to that here deſcribed.

It is right here to apprize the reader, that Mr. John Bell conſiders the propoſed inſertion of the upper end of the gut into the lower, and ſtitching them together, as perfectly impracticable; (ſee his Diſcourſes on Wounds, Part II.); and even if they were practicable, he aſſerts, ſuch an operation would certainly produce a new mortification, which could not but be fatal.

When the *omentum* appears prolapſed, the ſame general treatment is to be obſerved; only that, when it is dry and mortified, the dead part may ſafely be extirpated.—We ſhall conclude the article of abdominal wounds with a caſe from the memoirs of the Academy of Sciences for the year 1705, which ſhows that we ought not to deſpair, even though the moſt deſperate ſymptoms ſhould take place, as long as any vis vitæ remains.

A madman wounded himſelf in 18 different places of the abdomen. Eight of theſe penetrated the cavity, and injured the contained viſcera; he had a diarrhœa, nauſea, and vomiting; tenſion of the abdomen, with difficult reſpiration and violent fever, ſo that his life was deſpaired of. During the firſt four days he was blooded ſeven times; and during the greateſt part of the cure his diet conſiſted almoſt entirely of fleſh-broths, with the addition of ſome mild vegetables. By theſe means he was not only cured of his wounds, but reſtored to his right ſenſes. Seventeen months after, he went mad again, and threw himſelf over a precipice, by which he was inſtantly killed: on opening the body, the wounds were found to have penetrated the middle lobe of the liver, the inteſtinum jejunum, and the colon.

Such extraordinary cures are to be imputed, according to the ſatisfactory explanation of Mr. J. Bell, to the abdomen being per-

fectly full, and conſtantly ſubjected to ſtrong preſſure between the diaphragm and abdominal muſcles, which keeps the parts contiguous to a wound cloſely applied to it, prevents the diſcharge of fæces or even of blood in ſome meaſure, and gives an opportunity for a very ſpeedy adheſion between the parts.

Wounds of the Stomach.

We are able to diſtinguiſh a wound in the ſtomach by the direction of the inſtrument with which it was made; but more eſpecially by the violent ſymptoms which take place immediately after receiving the injury. Theſe are extreme ſickneſs, naufea, vomiting of blood, hiccup, debility, with a diſcharge from the wound of whatever is ſwallowed. Wounds of the left hypochondrium or epigaſtrium generally penetrate the ſtomach, alſo very oblique wounds of the lower belly; and, if the ſtomach happen to be much diſtended at the time, it is evident that it may be wounded, when it would have eſcaped uninjured had not this been the caſe.

Accidents of this kind are almoſt always fatal; however, we muſt not deſpair while any apparent poſſibility remains of aſſiſting the patient. The treatment is to be the ſame with that already directed in wounds of the bowels. Sometimes, if the wound happens to be in the anterior part of the ſtomach, we may unite the ſides of it by ſtitches, as already mentioned; but, if both ſides of it be penetrated, this can be of no uſe, but will only give uſeleſs pain to the patient.

In all penetrating wounds of the lower belly, the patient muſt lie upon the wounded part, that any bloody or ſerous matter may be diſcharged by the orifice, inſtead of collecting in the cavity of the abdomen. He muſt alſo be put very ſtrictly upon an antiphlogiſtic regimen. Fruits, either raw, baked, or boiled, may be uſed with great advantage, as well as milk, which affords the greateſt quantity of nouriſhment, with the leaſt digeſtion. Jellies of all kinds are alſo very proper; but, along with this kind of diet, we muſt remember that the inflammation is to be reſiſted by copious and repeated blood lettings, warm fomentations, and, in general, every thing recommended for that purpoſe under the head Inflammation. We may likewiſe obſerve, that, as in wounds of the ſtomach, it is abſolutely neceſſary, as much as poſſible, to avoid diſtenſion, we muſt give no more, even of the lighteſt kind of food, than is ſufficient to preſerve life; and even that is to be withheld, if we can preſerve life by means of clyſters of broth, milk, ſtarch, and other nutritious materials.

Wounds of the Liver and Gall-bladder.

It has occaſionally happened, that ſlight wounds of the liver have been cured; we muſt always account thoſe which are deep, or any way extenſive, as very dangerous, by reaſon of the great quantity of blood flowing through that viſcus, and the ſoft texture of the liver itſelf, which renders it very apt to pour out a great quantity of blood from a ſmall wound. Injuries of the gall-bladder are ſtill worſe; as in ſuch caſes the bile is evacuated into the cavity of the abdomen, where its tendency to putrefaction ſoon kills the patient.

In order to judge whether the liver is wounded, we muſt attend to the ſituation of the wound, and the direction of the inſtrument. As the whole right hypochondrium, with part of the epigaſtrium, is filled with the liver, we thence ſee, that, in all deep wounds of thoſe parts, there is great reaſon to fear that the liver is injured. We know this to be the caſe, by the diſcharge of a great quantity of very thick and black blood through the wound, by the diſcharge of bile, mixed with the blood, paſſed by ſtool, or ejected by vomiting. The white of the eyes, and ſurface of the whole body, become yellow, as in the jaundice; the abdomen ſwells, and becomes very tenſe, and a pain is felt ſtriking up to the top of the ſhoulder, ſometimes very ſeverely; which laſt being common in all inflammatory affections of the liver, is well underſtood.

Our endeavour, in wounds of the liver, ſhould be, to prevent or put a ſtop to the flow of blood, which is apt to prove exceſſive, and may be collected in the abdomen along with ſome portion of the bile. The hæmorrhage is to be ſtopped by blood-letting, a very cool regimen, and keeping the patient very quiet; injecting large clyſters of milk and water, which may act as fomentations to the bowels; or a mixture of one gill of fine olive oil, united with three of fine ſtarch, about the thickneſs of common mucilage of gum-arabic. Injections of this kind ought to be given frequently; and, that this may be done without any pain to the patient, we ought to cover the end of the pipe with a piece of the gut of a fowl, allowing about an inch of the gut to hang over it. But, as it will be impoſſible, in any caſe of a wounded liver, to prevent a very conſiderable effuſion of blood into the cavity of the abdomen, we muſt uſe our utmoſt endeavours to get it out, as the moſt fatal conſequences muſt undoubtedly attend its being allowed to remain there. This is to be attempted, by laying the patient upon the wounded part, depreſſing the head, and elevating the under part of the body; the wound in the integuments is alſo to be enlarged, ſo that a free diſcharge may be given to any collection of blood and bile which happens to be formed. We may

alſo make an opening in the abdomen at the moſt dependent part, for the ſame purpoſe. Beſides the clyſters already mentioned, the belly muſt be kept open by mild purgatives; and nothing anſwers better than the neutral ſalts: but, indeed, it is much to be regretted, that deep wounds of the liver ſeldom or never terminate favourably. As ſoon as every appearance of inflammation is gone, we muſt ſupport the patient's ſtrength by cordial medicines and diet, allowing him ſome wine, or other generous liquor, which may be moſt agreeable to him.

Where it happens that the gall-bladder is wounded, the caſe is ſtill more deplorable, and indeed may generally be conſidered as mortal. This can ſcarce ever happen without a large wound of the liver; at the ſame time, the gall-bladder being ſo covered with the former, that no weapon could get at it without paſſing through the liver. The only directions that can be given, are thoſe already laid down; only we muſt be ſtill more guarded in our prognoſtic than where the liver only is wounded, for, in fact, the inſtances of recovery from ſuch an accident are very rare indeed.

Wounds of the Spleen, Pancreas, and Receptaculum Chyli.

Some of the ancient phyſicians took it into their heads that the ſpleen was not only an uſeleſs, but a *pernicious* part of the body; and indeed experiments have been made, which tend to ſhow, that animals may live not only without *it*, but without a great part of the pancreas alſo. Nevertheleſs, wounds in theſe parts are certainly attended with great danger, on account of the vicinity of other important viſcera, and the large blood-veſſels, particularly thoſe belonging to the kidneys. There are not, indeed, any certain ſigns by which we can know when the ſpleen is wounded. The moſt remarkable, is the colour of the blood, which, in this viſcus, is as remarkably red, as in the liver it is remarkably dark. Mr. Hewſon ſuppoſed that the office of this organ was to prepare the red central globules of the blood; but, had this been the caſe, it ſeems impoſſible that any animal could live, while ſuch an important operation has ceaſed throughout the body; and we are certain that wounds in the ſpleen, unattended with any other injury, are not dangerous. The greateſt obſtacle to the cure of ſuch wounds, is the effuſion which unavoidably takes place in the cavity of the abdomen, more particularly when the duct of the pancreas happens to be divided; but no other directions can be given than thoſe laid down in a former part of this work.

A wound of the receptaculum chyli muſt always prove mortal, becauſe the body is thus entirely deprived of its nouriſhment; neither can any aſſiſtance be given them by ſurgery. The only thing that can be done, is to keep the patient very quiet, and with

as little food as poſſible for a conſiderable time, when the wound in the veſſel may perhaps heal up. Wounds of this kind are known by the white liquor which is effuſed along with the blood; and the ſame methods ought to be taken to prevent any collection from taking place in the abdomen as has in other caſes been fully deſcribed.

Wounds of the Kidney and Ureters.

To form a correct judgment of theſe it is neceſſary to conſider the ſituation of the kidney.

At its poſterior part, this viſcus is covered only by cellular ſubſtance, and united to the undermoſt ribs; on the fore part, it is covered by the peritonæum, behind which it lies, and is ſo placed that it cannot be wounded without penetrating, not only the ſmall inteſtines, but the colon alſo; after which, the urine will be diſcharged through the wound of the kidney and peritonæum into the cavity of the abdomen. The caſe, however, muſt be different, if the kidney happens to be wounded in the back part; for then the urine will be diſcharged along with the blood through the aperture made by the weapon.

Wounds in the anterior part of the kidney are therefore evidently much worſe than thoſe in the poſterior part; as in the former, not only the inteſtines are wounded, but the urine will be diſcharged into the cavity of the abdomen; and hence ſuch wounds prove almoſt conſtantly mortal. The ſymptoms attending them are violent pains, not only in the region of the kidney, but over the whole abdomen, ſtriking down to the groin, extending along the penis, and ſometimes affecting the teſticles alſo; the urine is greatly mixed with blood, and the voiding of it accompanied with much pain and difficulty. The patient is likewiſe much affected by ſickneſs and vomiting; which are generally aggravated till death cloſes the ſcene.

Where a wound of the kidney is given from behind, all the ſymptoms are much milder. The urine, indeed, is diſcharged by the orifice, and may inſinuate itſelf into the cellular ſubſtance with which the kidney is covered; from which circumſtance the principal danger ariſes. But this may be obviated, by enlarging the orifice, and keeping it conſtantly open, to allow a free diſcharge of the blood and other matters which may be collected in the wound, until the kidney be healed. For this purpoſe, a ſmall oval tube, ſomething reſembling that for an imperforated anus, may be made uſe of with ſucceſs, by allowing a free diſcharge of the contained or ſecreted fluids.

Wounds in the kidneys being attended with conſiderable hæmorrhagy, we muſt mitigate this by copious blood-letting; and by applying to the back, and region of the kidneys, cloths ſeveral

folds thick, moiſtened in vinegar and water. If we have the good fortune to ſtop the hæmorrhage, the immediate danger of the wound is over, and we may then proceed as already directed, keeping the patient as quiet and low as is conſiſtent with his health; though, indeed, after all we can do, it is probable that a fiſtulous opening will remain through life. The water, however, may always be drained off by the tube, which will prevent the neceſſity of uſing any cauſtic, or other ſevere means, for keeping the wound in a diſcharging ſtate.

Wounds of the Bladder.

A wound of the bladder differs very eſſentially, according to the ſtate of contraction or diſtenſion in which the bladder happens to be at the time of receiving it. While this viſcus is in its contracted ſtate, it lies wholly within the pelvis; but when diſtended with urine, it riſes ſo high, that it ſometimes reaches to the umbilicus. It is evident, therefore, that, in a diſtended ſtate, the bladder may be penetrated by a wound, which, in its contracted ſtate, would not touch it. In its contracted ſtate alſo, the upper part of it may be affected by a wound, which, in its diſtended ſtate, would reach its inferior part only.

As this latter part of the bladder is not covered by the peritonæum, it thence happens, that wounds in this part are not attended with any effuſion of urine into the cavity of the abdomen, which muſt unavoidably be the caſe where the upper part is wounded; and hence wounds of the upper part are neceſſarily the moſt dangerous.

When the bladder is wounded in its neck only, the danger is very little, as is evident from the many inſtances of recovery after the operation for the ſtone, in which this part is neceſſarily divided. But when the wound is ſituated ſo high up that the urine flows into the cavity of the abdomen, the danger muſt always be very conſiderable; and we know that this is the caſe, when the patient's urine is quite ſuppreſſed in the natural way; for it is certain, that when, by a wound in the upper part of the bladder, the urine has ſuch eaſy acceſs into the cavity of the abdomen, it cannot overcome the contraction of the ſphincter veſicæ, ſo as to paſs into the urethra. The ſame thing muſt happen, if the bottom or back part of the bladder are wounded; and the ſymptoms uſually attending injuries of this kind, are, 1. A conſiderable diſcharge of blood mixed with urine through the wound; 2. Violent pains of the lower belly, along with a tenſion gradually increaſing; 3. No diſcharge of urine by the urethra; and, 4. A pain and ſwelling of the whole belly gradually increaſing. Theſe laſt ſymptoms are occaſioned by the continual accumulation of urine in the abdomen, and will ſoon prove fatal, if great

care be not taken. The only method of removing theſe, is to enlarge the wound, ſo that every drop of urine may be evacuated from this cavity, where it produces ſuch miſchievous effects. When this fluid has immediate acceſs to the inteſtines, by being thus effuſed upon them, it produces ſuch violent inflammation, attended with excruciating pain, that the patient, for the moſt part, dies within thirty-ſix hours after the injury is received.

Mr. Latta, whoſe obſervations we continue to quote, here puts the following query: "Might not a quantity of warm water, injected by the wound (ſays he), prove uſeful in waſhing off this acrid liquor, and reſtoring the inteſtines to their former ſtate? for though the urine be as completely evacuated as poſſible, ſtill they muſt continue wet with it, and the inflammation will thus be kept up in a conſiderable degree, even after the evacuation has taken place."

It has been recommended by ſome writers on ſurgery to ſew up wounds of the bladder with the glover's future, as we do thoſe of the inteſtines. But, though general directions of this kind may have a plauſible appearance, yet when we come to the trial, we ſhall find it not only difficult, but next to *impoſſible* to put it in practice without deſtroying the patient. In the firſt place, the bladder, in its contracted ſtate, ſhrinks to a very ſmall ſize, ſcarcely bigger than a large walnut, when in an healthly ſtate; and in this ſituation, or nearly ſo, it would conſtantly remain: when, by means of a wound in its upper part, fundus, or back, the urine has free acceſs to the cavity of the abdomen, it will always be found in a contracted ſtate. Before we could get at it, therefore, we muſt enlarge the external wound much more than would be prudent: indeed, from the anatomy of the parts, it is evident that ſuch an operation ought not to be attempted; and that, in ſuch wounds, the art of ſurgery can give no aſſiſtance. In every other wound, however, where the urine is diſcharged through the external orifice, we muſt endeavour to prevent it from inſinuating itſelf into the cellular ſubſtance, by enlarging the wound, and keeping it open, until the wound of the bladder be healed. The dreſſings ought to be very light, and the patient laid upon his face, with the pelvis elevated, ſo that the urine may be entirely diſcharged by the wound, until the bladder be healed. Great care muſt be taken throughout the cure to keep off the inflammation, by blood-letting and other proper methods. Warm fomentations to the belly are here particularly proper, as well as the application of a number of leeches to the ſides of the wound; and the injection of mucilaginous and anodyne clyſters. If the patient be very much troubled with naũſea and vomiting, he muſt have a doſe of tincture of opium in half a pint of gruel or ſtrong ſoup. The injections ought to be given pretty frequently. At firſt, one may be

given every ſix hours; but after the ſymptoms have abated, if we give one morning and evening it will anſwer the purpoſe.

Wounds of the Head and Face.

In wounds of the head, where the cellular membrane only is affected, and the aponeuroſis and pericranium untouched, phlebotomy, lenient purges, and the uſe of the common febrifuge medicines, particularly thoſe of the neutral kind, generally remove all the threatening ſymptoms. When the inflammation is gone off, it leaves on the ſkin a yelloviſh tint and a dry ſcurf, which continue until perſpiration takes them away; and upon the removal of the diſeaſe, the wound immediately recovers an healthy aſpect, and ſoon heals without further trouble. But in the worſt kind of theſe wounds, that is, where a ſmall wound paſſes through the tela celluloſa and aponeuroſis to the pericranium, the patient will admit of more free evacuations by phlebotomy than in the former. In both, the uſe of warm fomentations is required; but an emollient cataplaſm, which is generally forbid in the eryſipelatous ſwelling, may in this latter caſe be uſed to great advantage. Where the ſymptoms are not very preſſing, nor the habit very inflammable, this method will prove ſufficient; but it ſometimes happens that the ſcalp is ſo tenſe, the pain ſo great, and the ſymptomatic fever ſo high, that by waiting the ſlow effect of ſuch means, the patient runs a riſk from the continuance of the fever; or elſe the injured aponeuroſis and pericranium, becoming ſloughy, produce an abſceſs, and render the caſe both tedious and troubleſome. A diviſion of the wounded part by a ſimple inciſion down to the bone, about half an inch or an inch in length, will moſt commonly remove all the bad ſymptoms; and if it be done in time will render every thing elſe unneceſſary.

In treating a *wound of the face*, it is of great importance to make the cicatrix as ſmall as poſſible. This, indeed, ought to be a particular conſideration in curing wounds, wherever they may be ſituated; but more ſo in the face than any-where elſe, on account of the deformity they occaſion, if the cicatrix be large. This can only be done by bringing the ſides of the wound into contact as completely as poſſible; and, in all caſes where the wound is ſituated directly on the face, we ought invariably to uſe the gold pins, or twiſted ſutures, by which the edges will be kept cloſe together without any retraction; but as the method of doing this has been elſewhere fully treated of and explained, we need ſay no more about it here; ſo that we muſt refer the reader to what has been ſaid on twiſted ſutures and harelip in their proper places.

If a wound of the forehead happen juſt above the eye-brows, it is ſometimes attended with pretty copious hæmorrhage from a ſmall artery which runs, in a groove, or through a notch in the ſuperciliary proceſs of the orbit, to the forehead. The danger ariſing from this hæmorrhage has been greatly magnified by ſome writers on ſurgery, inſomuch that they have told us not only of uſing the needle, but of removing part of *one*, or perhaps both tables of the ſcull. This laſt, however, can never be uſeful, nor even the needle itſelf; becauſe, though the artery does indeed paſs through a hole in the bone, this is by no means equivalent to paſſing through a long groove between the tables of the ſcull, as theſe writers have aſſerted. On the contrary, we may, without heſitation, affirm, that, wherever this hæmorrhage occurs, the blood may always be ſtopped, by applying a little ſponge or powder of agaric, and keeping it for ſome time upon the place. In wounds of the cheek, where the ſalivary ducts are injured, the ſame methods muſt be followed as have been directed in a ſubſequent part of this work; and, where theſe directions are punctually obeyed, we may venture to ſay that the patient will, almoſt always, be cured without any very conſiderable trouble.

Wounds of the Trachea and Œſophagus.

When the trachea is wounded, it is moſt commonly in a tranſverſe direction, generally between two of the cartilages; and, for the moſt part, it is only the anterior part of the tube that is wounded. Where the opening is but ſmall, it may generally be cured by means of a bit of adheſive plaſter, particularly when the head is kept in a proper poſition. But, where the wound is of ſuch extent as to divide the whole anterior part, it will be proper to bring the edges together, by means of the interrupted ſuture. In this caſe, we ought to make uſe of broad flat ligatures, and a flat crooked needle at each end of the thread. Theſe muſt be paſſed through the ſkin and cellular ſubſtance, upon the outſide of the cartilaginous tube of the trachea, at leaſt an inch above, and as much below the wound; and three or four of theſe ſtitches will generally be ſufficient for any injury in this part. Some practitioners have been in the uſe of putting the ſtitches through the trachea itſelf; but this is very injudicious, on account of the irritation they occaſion. In this caſe, a violent cough always takes place, and the ſtitches are again torn open; they ought therefore never to go deeper than the cellular ſubſtance. After they are introduced, the edges of the wound muſt be brought together, and kept in that ſituation by an aſſiſtant, until the ſurgeon ties the ligatures with a ſlip-knot, that we may have it in our power to ſlack or unlooſe them whenever there is occaſion. Laſtly, an adheſive plaſter is to be applied

over all, and the head fecured in a proper manner, fo that the rings of the trachea may remain in clofe contact.

It fometimes may happen, however, that the method juft now mentioned will fail; the cohefion of the parts may be too weak to retain the ftitches, and thus the wound may again fly open. Here, then, another method muft be employed. A ligature muft be paffed round one of the cartilages above, and another below the wound, which may eafily be done, by having two curved needles upon the fame flat thread, as before. We muft enter the point of one from within and below the firft and fecond cartilages on the under fide of the wound, puffing it outwards, and doing the fame thing with the other needle above. Having then paffed as many ligatures as may be deemed fufficient, we muft again bring the fides of the wound together, and tie the ligatures as directed. In general, there will be no more than three neceffary, one on each fide of the throat, and another as nearly in the middle as poffible.

It is very feldom the œfophagus can be wounded, without a divifion, at the fame time, of the large blood veffels and nerves, fo that the patient muft inftantly die. But, as it fometimes happens, that only fome fmall branches of arteries are divided, we muft in that cafe take them up, by means of the tenaculum and ligature, in order to ftop the hæmorrhage, and prevent the blood from getting into the ftomach, or into the cavity of the thorax, where, by irritating the lungs, it would produce a very troublefome cough, by which the patient's complaints muft all be much increafed. As foon as the veffels are tied up, and the hæmorrhage has abated, we muft bring the fides of the wound together, and retain them in their place by adhefive ftraps, which, however, will anfwer beft in longitudinal wounds of this part. In tranfverfe wounds of the œfophagus we muft enlarge the external incifions on both fides, fo that we may diftinctly fee the wound in the tube, and then, by means of the interrupted future, bring the fides together; though, it muft be confeffed, from the anatomy of the parts, there are fmall hopes of fuccefs from any fuch operation. In general, we muft account all wounds of this part exceedingly dangerous; but, if they can be united in fuch a manner that the patient's food can be prevented from falling into the cavity of the thorax during the cure, there is no doubt that the parts will unite here, as well as any-where elfe throughout the body. During all the time that the patient is confined, his food ought to be of the liquid kind, and moft eafy of digeftion, as milk-gruel, jellies, fago, falop, bread-pap, chicken broth, &c. Injections of ftrong broths alfo may be ufed with great advantage; and, indeed, for fome time, it will be proper to make an attempt to fubfift the patient entirely by nutritive injections, until the danger be paft of the food flipping into the cavity of the thorax, which muft always be fatal to the patient.

Wounds of the Joints.

The ligaments which inveſt the large joints, ſuch as the knee, ancle, ſhoulder, wriſt, and elbow, commonly called caſpular ligaments, have in general been conſidered as deſtitute of all ſenſation. But, though they do not in a ſound ſtate, or, when firſt they receive an injury, diſcover great ſigns of ſenſibility; yet, when once an inflammation takes place, the pain occaſioned by it is exceſſive; and we find, that ſuch wounds require much more attention than we would at firſt be apt to ſuppoſe. Some ſlight caſes, it is true, have eaſily healed, where a wound has penetrated the ligament, and the cavity of the joint has been laid open; but, in far the greater number of wounds of this kind, the utmoſt danger is to be dreaded, and the ſurgeon ought at all times to be upon his guard, as ſometimes the bad ſymptoms do not come on for ſeveral days after the injury is received. The time of their coming on, indeed, is various, principally according to the nature of the wound, by which the cavity of the joint is more or leſs laid open, and the air admitted to it. The firſt ſymptoms uſually are a ſtiffneſs in the joint, increaſing gradually, and attended with a deep-ſeated and dull pain; after which, the joint becomes ſwelled, tenſe, very painful, and ſomewhat inflamed; by reaſon of all which the patient refuſes to attempt moving it. All the bad ſymptoms continue daily to increaſe, until the ſwelling and inflammation round the joint become very conſiderable, inſomuch that the patient at laſt can ſcarce bear it to be handled in the moſt gentle manner, and will not allow the leaſt attempt to be made to move it. All wounds of the cavity of a joint are attended with an efflux of the ſynovia; but, as the ſwelling increaſes, and the edges of the wound become thicker, this efflux is gradually ſtopped, and the edges of the wound become ſtiff and dry, and appear ſloughy. This is, in a ſhort time, ſucceeded by large, ſoft, and very painful ſwellings, particularly on the anterior and inferior edges of the patella; which, increaſing by degrees, ſurround the whole of the lateral and anterior part of the joint. Theſe, when they either burſt naturally, or are laid open artificially, pour forth a conſiderable quantity of matter, compoſed of pus, ſynovia, and the liquid contained in the burſæ mucoſæ. Some relief is uſually obtained by the evacuation of this matter; but this is only of ſhort duration, for new ſuppurations conſtantly take place, the bones become corroded, and the patient is ſeized with an hectic, which gradually deſtroys him.

It is in this way that we ſee almoſt all wounds in the ligaments end, particularly if the cavity of the joint has been laid open, and the cure left to nature. From attending to the detail of the ſymptoms from the very beginning, we may ſee that the cure

depends entirely upon excluding the air, if poſſible, from the cavity of the joint; for it is, in an eſpecial manner, by this acceſs that the bad ſymptoms are produced; and, if theſe cannot be prevented in any other way, it muſt be done by amputating the limb entirely. It is indeed of no leſs pernicious conſequence to admit air into the cavity of a large joint, than into thoſe of the thorax or abdomen, and death will as certainly be the conſequence of the one as of the other. Hence it is evident, that the care of the ſurgeon muſt be conſtantly directed to prevent the acceſs of the external atmoſphere into the cavity of the joint, and to produce a cicatrix as quickly as poſſible. Where the ligaments are greatly lacerated, this is generally impracticable, though it may be done where the opening is but ſmall; for, in theſe caſes, we may generally, by placing the limb in a proper poſture, and drawing the ſkin over the wound in the ligament, exclude the air entirely. This ought always to be done in ſuch a manner as not to allow the ſkin to retract in the leaſt; and for this purpoſe we may properly apply adheſive plaſters. Having then put the patient to bed, and laid him in the moſt convenient poſture, in which he muſt continue for ſeveral days, we muſt endeavour, by means of adheſive ſtraps, to pull the ſkin over the wound in the ligament, in ſuch a way as to ſhut out the air completely; and in this way it ought to be kept ſhut conſtantly until the wound in the ligament be filled up. But, if we find it too difficult to retain the parts in contact, by means of adheſive ſtraps, we muſt then have recourſe to the interrupted ſuture; the method of doing which has been elſewhere treated of. The ſkin ſhould then be kept in its place by a roller, either of linen or flannel, and the leg placed in ſuch a ſituation as to allow the ſkin to be relaxed as much as poſſible. When the wound is on the anterior part of the joint, this is done by ſtretching out the leg; but when the wound penetrates through the ham, bending the knee is the method we ſhould take to relax the ſkin.

Wounds of the ſkin and integuments of the knee joint require to be thus treated, after the extraction of the ſmall bony ſubſtances that form in the larger joints, and are called *ſeſamoid* bones. The method of performing the operation is as follows: the limb muſt be completely ſtretched out, and the ſkin of the part drawn up by an aſſiſtant as much as poſſible. The ſurgeon is then to ſecure the bone, by preſſing upon each ſide of it with the fore and middle fingers of his left hand, and, with a ſcalpel, make a tranſverſe inciſion, through the whole extent of it, in the teguments and capſular ligament. The wound is to be no longer than juſt to allow the ſmall bone to be taken out with a hook, and the air is to be excluded as completely as poſſible, by preſſing down the ſkin cloſe to the bone as we remove it, and, immediately after the removal, preſſing it down again upon the wound in the capſular ligament, upon which it acts as a valve. Having done this, the moſt

effectual mode of preventing the air from finding acceſs again, is by uſing the interrupted ſuture; after which the limb muſt be laid quiet, and the inflammation prevented, by uſing the antiphlogiſtic regimen. Blood-letting ought to be uſed freely, the bowels ought to be kept lax, and a gentle moiſture kept upon the ſkin by a diaphoretic mixture; of which the beſt kind is one compoſed of aq. ammon. acet. and antimonial wine.

In caſe the proper mode of treatment has been ſo long neglected, that cloſing up the wound would be productive of no good effect, we muſt endeavour, by every poſſible method, to remove the inflammation which has already taken place; uſing every effort at the ſame time to prevent the admiſſion of more air, by covering up the wound with pledgets ſpread with ſome kind of mild emollient ointment. The beſt method of allaying inflammation in the large joints is by topical blood-letting, with leaches, cupping, and ſcarifying, bliſtering, and fomenting the part with aſtringent lotions. Blood-letting is here eſpecially of uſe; and the more blood is taken away, and the quicker it is done, the greater is the chance of the inflammation being removed. The reaſon why the inflammatory ſymptoms riſe to ſuch an height in caſes of wounded joints is, that the colourleſs veſſels about the joint become filled with blood, which proves a violent ſtimulus, as well as the air admitted into the cavity. It is, therefore, of the greateſt conſequence to take blood freely from the part; this ought always to be done in the firſt place; after which we may uſe aſtringents, as the ſteam of warm vinegar. The beſt method of applying this is by means of a wooden box, exactly fitting the limb, from the middle of the thigh to the middle of the leg, when the leg is ſtretched out upon the bed; and ſo cloſe that little or no air can get out betwixt the limb and the edges of the box, the under ſide of it being contiguous to the bed. The vinegar is placed at the patient's bed-ſide, in a large pan put over hot coals. The ſteam is conveyed into the inſide of the box by means of a hole in one of the ſides, through which a tinned iron funnel paſſes from the pan directly oppoſite to the knee joint which it ſurrounds; and its eſcape is prevented, by covering the box with a blanket, beſides the precautions already mentioned. The fomentation ſhould be continued twice or thrice every day, half an hour at a time. As long as the pain continues violent, the patient ſhould have a large doſe of an opiate twice a day; and, by perſevering for ſome time in the uſe of theſe remedies, the diſeaſe will often be greatly relieved, or even completely cured, where the injury is not very great, and where the ſurgeon has been called in proper time. But in caſes where the laceration of the ligament has been very great, the inflammation will at laſt probably terminate in ſuppuration, whatever pains we take to prevent it. The conſequence of this is what we have already mentioned, viz. deſtruction of the ligaments, corroſion of the ends of the bones; after which, little or no hope

of saving the limb remains; for, whatever care we take to evacuate the matter, new abscesses still break out, and the patient is destroyed, unless the limb be taken off. There is not, indeed, any well-authenticated case, where the cavity of a joint has been fully penetrated by matter, that the patient has ever recovered, even so far as to have an anchylosis; and this, whether the ligaments have been lacerated, or whether they have been laid open by incision. The reason of all this is obvious. If the matter penetrates through the whole cavity of the joint, it is impossible to exclude the air also; and this will produce such an affection of the whole body of it, as will greatly aggravate all the dangerous symptoms described above.

In slighter injuries of the capsular ligament, we sometimes prove successful, by excluding the air as completely as possible from the first, and doing every thing in our power to abate the inflammatory symptoms from running to a great height. In these cases the limb may be saved; and, indeed, in all cases where small bones or hardened cartilages are cut out, the wound may be so completely shut up that no air can enter it, and thus a cure may be effected, without any danger of stiffness in the joint. Cases of this kind have occurred, in which the patient was able to walk in twenty-eight days from the time he received the injury. But, where the joints have been penetrated by large wounds, and these have nearly terminated in suppuration also, where the capsular ligament and ends of the bones have been much injured, instant amputation is generally advisable.

It has been alleged by surgeons of great eminence, that patients, in their full health and vigour of body, recover much more seldom from injuries of this kind, than such as have been considerably wasted by suppuration, and other severe symptoms. But, if proper attention be paid for the first four or five days, it sometimes happens that a healthy and strong patient will recover much more quickly than one that has suffered much from the debility induced by too great suppuration or otherwise. The only and great danger arises from the high degree of inflammation which takes place immediately after the operation. But this, by judicious management, may always be kept under; and an experienced and skilful surgeon will not fail to use the means proper for the purpose, viz. bleeding, keeping the patient cool and exposing the end of the stump as much as possible to the air, leeches, and, lastly, keeping it moist with cloths dipped in a solution of vitriolated zinc.

Sect. II. *Of punctured Wounds.*

Wounds which are made by any inſtrument that perforates to a greater depth than it ſeparates the divided parts, either longitudinally or laterally from each other, without regard to the ſhape of the wounding inſtrument itſelf, whether ſharp or obtuſe, may be called *punctured* wounds. The event of theſe is always more uncertain and dangerous than of any other kind, becauſe the large blood veſſels, or branches of nerves, may be wounded, though we cannot perceive from the appearance of the wound that they are ſo. In all caſes, however, they are dangerous in proportion to the depth to which they penetrate, and as the inſtrument is more or leſs obtuſe; and hence gun-ſhot wounds are of all others the moſt dangerous, becauſe they are accompanied with the higheſt degree of contuſion and laceration. Punctured wounds of all kinds are, indeed, productive of a very great degree of inflammation, and even, on that account, extremely dangerous. By the violent action of a muſket-ball alſo pieces of the clothes are driven into the wound, beſides the danger there is of the ball itſelf lodging in it; ſo that it is often very difficult to clear ſuch wounds of extraneous bodies; and, even when they are cleared of them, the ſides remain at a diſtance from one another, and cannot be brought together by future, or by any of the means uſed in treating ſimple wounds.

There is no caſe of punctured wounds ſo little hazardous as when they only penetrate the ſkin, and run through the cellular ſubſtance for a conſiderable way, parallel to the ſurface of the body, perforating the ſkin alſo on the other ſide, oppoſite to where it entered. When this happens to be the nature of the wound, there ought to be no heſitation at laying it open from one end to the other, in order to clear it of any extraneous matter. This being done, the wound ought to be dreſſed with the ſimple cerate of wax, and the dreſſings kept on by a ſlight bandage and compreſs of linen rag.

The next moſt favourable caſe is where the inſtrument has not penetrated both ſides, but, after perforating the ſkin, ſtops in the cellular membrane. The general directions given by chirurgical authors in this caſe is to introduce a probe by the external opening through the whole length of the wound, and, cutting upon it, to lay it open as before. The inciſion ought to be carried through the whole length of the wound, in all caſes where it has not penetrated any of the large muſcles, nor injured any of the blood veſſels or nerves. But, where the wounds run deep, and in the neighbourhood of blood veſſels or nerves, we cannot lay them open in this manner; the proper mode of treatment then is to prevent or remove the inflammatory ſymptoms from running too

high, by leeches, cooling ſolutions, and an antiphlogiſtic regimen, inducing throughout the whole extent of the wound a gentle ſuppuration; which, in every wound of this kind, muſt take place, becauſe none of them can be cured by the firſt intention. A poultice muſt be applied externally throughout the whole length, and in the ſame direction with the wound, which muſt be frequently removed, until the ſuppuration be complete. When this is done, and the wound appears free of any extraneous matter, we may gently preſs the ſides of the wound together, by means of a compreſs of a proper thickneſs applied to the wound throughout its whole length, applying over it a roller pretty firmly, and uniformly tight throughout the whole length of the wound, by which its ſides will adhere in a much ſhorter time. If, however, this manner of treatment be neglected for a week or two, and the poultice ſtill continued, there will be a conſtant diſcharge of matter, by which the ſides of the ſore become callous, ſo that though we were afterwards to preſs them together ever ſo much, they will not unite, but the wound will change into a true fiſtula. When this happens, it may always be known by the condition of the matter. In a wound which is diſpoſed to heal, the matter is thick, mild, and of an unctuous nature, of a whitiſh yellow appearance, and ſomewhat ropy; but, in ſerous ulcers, the diſcharge is thin, and has a milky whiteneſs; and, by reaſon of the calloſity, their ſides acquire a ſmoothneſs, which is eaſily diſtinguiſhed from the appearance of a healthy wound. The proper method of proceeding in caſes of this kind is to introduce a ſeton, by the friction of which an inflammation will be raiſed on the ſides of the wound, and the matter ſoon acquire a better colour and conſiſtence. As ſoon as the ſurgeon perceives this, he muſt gradually diminiſh the ſize of the ſkain, in the manner already directed when treating of ſetons. When the cord becomes very ſmall, it may then be taken out altogether; and what little of the wound remains to be united, will eaſily be ſo, by applying the compreſs, as juſt now directed. In many inſtances, this adheſion has been produced by the injection of aſtringents, or diluted ardent ſpirits, or any thing capable of exciting a freſh inflammation and ſuppuration in the wound; the ſides of which muſt be kept in contact from the beginning of this application, till the adheſion is formed throughout. If matters are properly managed at firſt, however, there will very ſeldom be any occaſion either for the ſeton or aſtringent applications; for the greater number of caſes, if the ſurgeon, as ſoon as a free and full ſuppuration takes place, would apply a compreſs to the wound, throughout its whole length, with a roller above to keep it pretty tight, ſo that the ſides of the wound might be in contact, and preſerve them in that ſituation for thirty-ſix hours, the parts, even in that ſhort time, would begin to adhere; and, by perſiſting in this method,

would be completely healed in ten, twelve, or fourteen days at moſt, with little or no uneaſineſs to the patient.

If, however, this kind of treatment be neglected, fatal conſequences may occur, even under the management of the moſt celebrated practitioners; or elſe the cure of ſuch wounds may be protracted for as many weeks as it would require days in the former method. By treating wounds of this kind in the manner juſt now recommended, when they run deep, and of courſe cannot be laid open, we may always be certain of making their ſides adhere to each other in a few days; but this muſt never be attempted until we are ſure that a free ſuppuration has come on, throughout the whole extent of the wound, and that no extraneous body is left in it.

Frequently the direction of the wound, inſtead of paſſing ſlanting towards one ſide, runs directly to the bone, with only a ſmall opening at the ſurface. Where wounds of this kind occur, and it can be done without wounding any conſiderable nerve or blood veſſel; the wound ought to be dilated to the bottom, in the direction of the muſcular fibres, dreſſing it afterwards with ſome ſoftening liniment, ſpread upon linen; and this is to be continued until a full and free ſuppuration takes place through the whole of the wound; and, as ſoon as this takes place, we ought to unite the ſides, by means of the interrupted ſuture, as in the caſe of recent wounds, that they may be healed by the firſt intention; and thus the wound will moſt commonly heal very readily and eaſily, without much pain to the patient, and with great eaſe and ſatisfaction to the ſurgeon. In this laſt caſe the uſe of counter-openings of any kind would be very improper.

Injections are thrown into wounds of this kind, in order to raiſe a freſh inflammation, by means of which the ſides will adhere together, when held together with a compreſs and roller. Thoſe moſt proper for this purpoſe are ſuch as do not poſſeſs any conſiderable degree of aſtringency, nor have any great tendency to remove inflammation. The moſt proper are ardent ſpirits diluted with an equal quantity of water, and this thrown into the wound with a ſyringe, and confined in it for a ſhort time, till the patient complains of pretty ſevere pain. The following ſolution is likewiſe found very efficacious:

(No. 2.) ℞ Hydrarg. muriat. gr. ij.
Ammon. muriat. gr. v.
Aquæ diſtillatæ ℥ij. Fiat ſolutio.

But, whether we uſe this or the former, the ſides of the wound are to be put cloſe together, as ſoon as the injection is thrown in, till the new inflammation produces adheſion; and this muſt in a very ſhort time take place, if the compreſſion be equal and regular throughout the whole courſe of the ſinus. If, inſtead of uſing injections of this kind, we take a contrary method, and make uſe

of thoſe of an antiphlogiſtic nature, the ſides of the wound will ſoon be rendered callous throughout its whole length, and thus the very intention with which the injections were preſcribed will be defeated, for the only uſe of them is to excite inflammation, not by any means to oppoſe it.

It ſometimes happens in punctured wounds, when the preſſure is unequal, that matter will be formed. This takes place near the bottom of the wound; and, unleſs the ſurgeon pays great attention to apply the bandage and compreſs properly, it may continue to collect, and burſt ſeveral times over; but even this will at laſt be overcome, by a proper uſe of the bandage and compreſs. But if, for any reaſon, the ſurgeon does not think proper to attempt a cure by the firſt intention, he ought to proceed in ſuch a manner, that the incarnation may begin from the bottom upwards, which is very eaſily done where the wound is dreſſed very ſlightly, and only the mildeſt ointments are allowed to touch the ſore, the dreſſings being removed once in twenty-four hours, or oftener. Thus every wound, whatever be its depth, if ſituated in any of the extremities, without injuring any blood veſſel or nerve, may very ſoon be healed without any tents made either of metal or any thing elſe. There may be ulcers indeed, which have penetrated into a cavity, ſuch as in the perinæum, communicating with the urethra. In caſes of this kind ſome practitioners uſe a metallic tube to carry off the water or matter, in order to allow the urethra to heal, but a hollow tube of elaſtic gum is to be preferred.

The acknowledged principle on which tents are ever uſed is, that matter may be prevented from collecting beneath, after the external wound is cloſed; but it is ſeldom that this inconvenience takes place, and it never can do ſo if the method juſt recommended be followed; beſides, as the aperture of the wound gives free vent to the matter at firſt, the latter generally keeps it open, unleſs in a very few caſes, where it may be neceſſary to uſe artificial means for the purpoſe. Even here, however, the tents, if theſe are uſed, ſhould be but ſmall, for otherwiſe they will plug up the orifice, ſo that they will induce the very evil they are deſigned to prevent. Hollow tents, or tubes, are preferable to others, and ought to be employed on account of their allowing a free exit to the matter. They may be made either of ſilver, lead, or elaſtic gum; but the latter are to be preferred, on account of their flexibility.

Sect. III. *Of contuſed and lacerated Wounds.*

When the ſmall veſſels are broken by a blow with any hard inſtrument without penetrating the ſkin, at the ſame time that the ſolid fibres of the part are cruſhed, the injury is termed a *contuſion*; and when at the ſame time the ſkin is broken, it is termed

a contuſed and lacerated wound, becauſe in this caſe the parts are not fairly divided as with a knife, but torn aſunder or violently ſtretched.

Every contuſion, therefore, whether the ſkin is broken or not, may properly be reckoned a wound; for, where the injury is ſo ſlight that none of the contents of the ſmall veſſels are extravaſated, it ſcarce deſerves to be mentioned. The immediate conſequence of a contuſion, therefore, is a ſwelling, by reaſon of the extravaſation juſt mentioned; and the ſkin becomes diſcoloured by the blood ſtagnating under it; but as this fluid, even though covered by the ſkin, cannot long remain in its natural ſtate, it then happens that the contuſed part ſoon loſes its florid red colour, and becomes blue or black; the thinner parts being in the mean time gradually taken up by the abſorbent veſſels, which at laſt happens to the blood itſelf; the blue diſappears, and is ſucceeded by a yellowiſh colour, ſhowing that the blood is now diſſolved; after which the part recovers its former appearance, and the ruptured veſſels appear to have united as though nothing had happened.

Theſe are the ſymptoms which attend the ſlighteſt kind of contuſions; but it is evident, that where the blow is ſo violent as to rupture or cruſh ſome of the large nerves, or blood veſſels, all the bad conſequences which attend ſimple wounds of thoſe parts will enſue, and they will not at all be alleviated by the circumſtance of the ſkin being whole. Hence it is eaſy to ſee how a contuſion may produce ulcers of the worſt kind, gangrene, ſphacelus, carious bones, &c.; and, if it happens to be on a glandular part, a ſcirrhus or cancer is very frequently found to enſue. Even the viſcera themſelves, eſpecially of the abdomen, may be injured by contuſions to ſuch a degree as to produce an inflammation, gangrene, or ſcirrhus, nay inſtant death, without rupturing the ſkin.

For wounds of this kind Mr. Latta recommends the following treatment: The patient ought to be put to bed, and the wounded limb placed in the moſt relaxed poſture, ſo as to eaſe, as much as poſſible, the wounded or torn muſcles. The wound ſhould, as quickly as poſſible, be freed from every extraneous matter, as well as from broken pieces of bone, and the wounded and bleeding veſſels being properly ſecured, the lacerated edges ought to be placed as near to each other as poſſible; after which the whole muſt be covered with a large pledgit ſpread with emollient ointment, with two or three folds of linen put over all. As the inflammatory ſymptoms run very high, and are apt to terminate in gangrene, we muſt endeavour, by every poſſible means, to prevent ſuch a dangerous event. In young and plethoric patients, ſome ounces of blood ought to be taken from the arm; and as, in caſes of this kind, the wound bleeds little, though ſeveral ſmall

arteries may be wounded, we muſt apply leeches all round the ſore, encouraging the diſcharge of blood by the application of large emollient poultices applied warm. If leeches, as it ſometimes happens, cannot be procured, we muſt, with the point of a fine lancet, make a number of punctures through the ſkin, and endeavour to draw blood from them with a cupping glaſs; which, if done at all, ought to be in as great quantity as poſſible, for we know of nothing which gives greater and more effectual relief in the inflammation attending wounds, than taking blood freely away round the tumified edges. The bowels ought alſo to be kept open by gentle cooling laxatives, while the food and drink ought to be of the moſt ſimple and light kind. In caſes of very ſevere pain, laudanum, in pretty large doſes, muſt be given twice in twenty-four hours; to an healthy, full grown perſon, not leſs than thirty drops in the morning, and as much at bed-time. A large emollient poultice is to be applied, of ſuch a ſize as exactly to cover the wounded parts, and ought to be renewed every ſix hours, to promote, as much as poſſible, a reſolution of the ſwelling of the limb; but, as ſoon as the ſuppuration becomes complete, the poultice muſt be removed, and the diſcharge promoted by mild dreſſings alone. When the injury is very great, however, wounds of this kind are very apt to become gangrened. This always happens in one of the following ways: 1. When the arteries of the limb are totally deſtroyed; or, 2. By a very violent inflammation, which cannot be reſolved, and ends in gangrene, in ſpite of every attempt to ſtop it, either by reſolution or ſuppuration. In all caſes where we have reaſon to fear that a gangrene will take place, we ought to lay aſide the antiphlogiſtic regimen, and endeavour to ſupport the patient's ſtrength by as nouriſhing a diet as the patient's ſtomach can eaſily bear; attempting, at the ſame time, to reſtore the tone of the ſyſtem by cordial medicines, given in proper quantities, ſo that the patient may be invigorated, without being much heated, or his pulſe much quickened. In other patients, particularly thoſe who have been accuſtomed to drink ſtrong malt liquors when in health, we muſt allow a moderate uſe of the ſame now; and, in ſuch perſons, it will be found that malt liquor anſwers much better even than wine. The ſame muſt be done with thoſe who have been accuſtomed to ardent ſpirits. They are to be allowed their favourite liquors, only not in ſuch quantity as to heat or quicken the pulſe in any great degree. Tonic medicines, ſuch as the Peruvian bark, in fine powder, and given in doſes of not leſs than a drachm at a time, are very proper. Theſe doſes are to be repeated every two hours, if the patient's ſtomach will bear it. But, in caſes where the patient has naufeated the powder, the following mixture may be conveniently adminiſtered;

(No. 3.) ℞ Pulv. cinchon. flav. ʒij.
Mucilag. G. Arab. ʒiij.
Tinct. cinchonæ
Aq. cinamom. aa ʒiv.
Acid. vitriol. dilut. q. ſ. ad gratam aciditatem.
Miſce.

The doſe of this may be two tableſpoonfuls every two hours.

Mr. Latta found, that, in caſes where the debility was very great, and wine and bark perſevered in for ſome time without any good effects, a bolus compoſed of twelve grains of volatile ſal ammon. made up with half a drachm of conſerve of roſes, and given three times a-day, proved extremely ſerviceable in ſtrengthening the ſyſtem, ſo as to enable it to put a ſtop to the gangrene. By perſevering in the uſe of this along with the opiate, morning and evening, the diſeaſed parts may at laſt be thrown out, and the wound afterwards dreſſed as a ſimple ulcer. It is almoſt needleſs to caution any practitioner againſt blood-letting, or any other evacuation, where gangrene is coming on; for, by theſe, the tone of the ſyſtem is remarkably weakened; and, the more evident the ſymptoms of the diſeaſe are, the greater will be the injury done to the ſyſtem by an evacuation. But, while it is neceſſary to caution the practitioner againſt any evacuations *after* the gangrene has made its appearance, we muſt no leſs ſtrongly recommend them in the *beginning*, while the ſymptoms of inflammation may be expected to run high; and that, eſpecially in robuſt conſtitutions, where the powers of life ſtill retain their vigour after the injury has been received, as in ſoldiers and ſailors. In theſe we ought to take blood very freely all about the edges of the wound, and particularly on the contuſed places. If this is done, there is very little probability that a gangrene will enſue in any caſe, even after the moſt violent injuries, if, along with the proper evacuations, we take care to keep the patient in the moſt eaſy poſture, and to free the wound from any extraneous bodies that may irritate and ſtimulate the wounded parts. The edges of the wound are alſo to be kept as near as poſſible to one another, and the dreſſings ought to be of pieces of lint ſpread with the mildeſt ointment, covering the whole up afterwards with ſeveral folds of linen put over the dreſſings. In all caſes where the contuſion extends to any conſiderable diſtance from the wound, we muſt take care to bleed freely all round it with leeches, or by cupping with ſcarification. If neceſſary, we muſt bleed freely at the arm, to keep the body cool; and, after each free bleeding from the vicinity of the wound, cover it with cloths moiſtened with vinegar and water, or a ſolution of vitriolated zinc.

If this method has been perſevered in, the inflammation, which extends to ſome diſtance from the wound, will generally terminate

by reſolution; to promote which, the linen folds directed to be laid over the wounded part being removed, an emollient poultice ſhould be put in their place, exactly of the ſize of the wound, and changed regularly every twelve hours; while, at the ſame time, if pain and ſwelling ſtill continue in the neighbouring parts, they ought to be covered regularly with the wet cloths. As ſoon as a free ſuppuration takes place, the wound ought to be dreſſed as a ſimple purulent ulcer, in the manner already deſcribed; and, if the pain, tenſion, and ſwelling, are ſtill conſiderable round the wound, we ought to continue our diſcutient method; but, if we ſee that a mortification will actually take place, we muſt uſe every endeavour to put a ſtop to it as quickly as poſſible. The means of doing this will be treated of elſewhere: at preſent it is enough to obſerve, in general, that they conſiſt of ſuch things as keep up the tone of the ſyſtem, and invigorate the body. The mortified or gangrened parts are always ſeparated from thoſe which are ſound by an inflammation and ſuppuration; and the firſt ſign of this is the appearance of a red inflamed ring round the edge of the mortified part. This inflammation may be excited, or at leaſt greatly promoted, by the application of warm and ſtimulating dreſſings; but, as ſoon as this is obſerved to take place, we muſt diſcontinue the uſe of them, and have recourſe again to emollient poultices, to promote the ſuppuration neceſſary to ſeparate the mortified parts from the ſound. Such as are completely mortified ought to be removed, not only as they are abſolutely uſeleſs, but on account of the offenſive ſmell which they occaſion. In this caſe the *cataplaſma effervoſcens* of the Pharmacopœia Chirurgica will be particularly uſeful.

Sect. IV. *Of Gun-ſhot Wounds.*

Gun-ſhot wounds can be conſidered in no other light than contuſed wounds. In thoſe made by a muſket or piſtol ball, the moſt immediate conſiderations are to extract the ball, or any other extraneous body which may have lodged in the wounded part, and to ſtop the hemorrhagy, if there is an effuſion of blood from the rupture of ſome conſiderable artery.

It is frequently neceſſary to enlarge the wound, in order to extract the ball; and if it has gone quite through (provided the ſituation of the part wounded will admit of its being done with ſafety), the wound is to be laid freely open through its whole length; by which means any extraneous body will be more readily removed, and the cure facilitated.

In order to get at the ball, or any other foreign matter, probing is to be uſed as ſparingly as poſſible; and this muſt evidently appear to any one who will only conſider the nature of the ſymptoms attendant on penetrating wounds of the breaſt or belly,

either from a bullet or ſharp inſtrument; the thruſting in a probe to parts under ſuch circumſtances being unavoidably a freſh ſtab on every repetition of ſuch practice. If probing be neceſſary, the finger ſhould be preferred as the beſt and trueſt probe, where it can be uſed; where it cannot, a bougie may anſwer the purpoſe.

If a ball, or any other foreign body, happens to be lodged near the orifice, or can be perceived by the finger to lie under the ſkin, though at ſome diſtance from the mouth of the wound, we ſhould cut down to it, and take it out; but when it is ſunk deep, and lies abſolutely beyond the reach of the finger, it muſt appear evident, upon the leaſt reflection, that thruſting firſt a long probe in queſt of the bullet, and then, as has been practiſed likewiſe, a longer pair of forceps, either with or without teeth, into a wound of that kind, though with a ſort of certainty to extract it, muſt either contuſe, or irritate and inflame, the parts to a great degree; and, conſequently, do as much or more miſchief than the ball did at firſt by forcing its paſſage ſuch a length of way. And ſhould they, at the ſame time, lay hold of any conſiderable artery or nerve along with the ball (which can ſcarce fail of being the caſe), what ſhocking conſequences would attend ſuch a proceeding! nor would attempts of this ſort be leſs injurious, in caſe a bullet ſhould happen to be lodged in the cavity of the belly or breaſt. Such attempts are the leſs neceſſary, becauſe a great number of inſtances have occurred, where balls have quietly lodged in ſeveral parts of the body, till, after many years, they have worked themſelves a paſſage towards the ſurface, and were very eaſily extracted, and many where balls have been entirely left behind without any ill conſequences.

In caſe the wound be occaſioned by a muſket or piſtol ſhot, and of courſe but ſmall, it will be neceſſary to *dilate it* without delay, provided the nature of the part will admit of this with ſafety; for in wounds near a joint, or in very membranous or tendinous parts, the knife, as well as forceps, ſhould be put under ſome reſtraint; nor ſhould any more opening be made than what is abſolutely requiſite for the free diſcharge of the matter lodged within.

Where the wounded perſon has not ſuffered any great loſs of blood (and this is generally the caſe), it will be adviſable to open a vein immediately, and take from the arm a large quantity; and to repeat bleeding as circumſtances may require, the ſecond, and even the third day. Repeated bleedings in the beginning draw after them many advantages; they prevent a good deal of pain and inflammation, leſſen any feveriſh aſſaults, forward the digeſtion, and ſeldom fail to obviate impoſthumations, and a long train of complicated ſymptoms, which are wont otherwiſe to interrupt the cure, miſerably haraſs the poor patient, and too often endanger his life. Even where the feveriſh ſymptoms run high, and there

is almoſt a certainty that matter is forming, bleeding, in that ſtate, is very frequently of great advantage.

If it ſo happen that a gun-ſhot wound has penetrated any of the large joints, and, in paſſing through them, fractured the ends of the bones, it will then be found for the moſt part impoſſible, let the ſkill or abilities of the ſurgeon be ever ſo great, to preſerve both the life and limb of the patient. The reaſon of this is, that the acceſs of air to the cavity of the joint excites ſuch a violent inflammation as would certainly end in gangrene; and, therefore, for the moſt part, it will be proper, as ſoon as poſſible, to take off the limb. Indeed, in every caſe of compound fracture, whether produced by bullets or not, where the bones are much ſhivered, and the muſcles and ligaments torn in ſuch a manner, that no well-founded hope of ſaving the limb can be entertained, it would be highly improper to perſiſt in vain attempts for that purpoſe; for thus the patient's ſtrength may be entirely exhauſted by the great diſcharge of matter, or he may be deſtroyed by an hectic fever, raiſed by the abſorption of the matter, ſo that even the amputation of the limb could not ſave his life. We are, however, far from adviſing any ſurgeon to amputate where there is a probability of ſaving a limb; nor is it any ordinary injury that can vindicate him for doing ſo. It is not enough that the bone be broken, and ſeveral of the fragments of it driven into the ſurrounding fleſh, the muſcles themſelves being alſo penetrated and contuſed by the ball. If none of the ſplinters reach the length of the joint, ſo that there is no danger of expoſing the cavity of it to the air, if none of the large veſſels be wounded, or otherwiſe injured, ſo that the circulation cannot go on, no amputation ſhould ever be thought of in ſuch caſes. Dr. Aitken's machine, ſo uſeful in compound fractures, will alſo ſupport the limb properly, until the cure be accompliſhed. Nay, even when a ball has ſtruck the head of a bone in ſuch a manner as to fracture it completely, if the ball has fairly paſſed out through the other ſide, without injuring any of the large blood veſſels, there is ſtill no reaſon to amputate immediately. Here we ought carefully to remove the looſe pieces of bone; and, if there be any conſiderable hæmorrhage from the ſmall arteries round the joint, it ought to be ſtopped, by applying ſome kind of ſtyptic to the mouths of the bleeding veſſels, afterwards filling up the wound with dry charpie, placing the limb in the moſt convenient poſture, and laying the patient as eaſy as poſſible. Several folds of lint ought then to be put over the charpie, of ſuch a ſize as exactly to fit the cavity of the wound, laying over the whole a large compreſs of linen, and retaining the dreſſings with a proper bandage. If the patient has not loſt much blood, and be of a plethoric habit, we muſt have recourſe to bleeding freely at the arm; the wound muſt be covered lightly; and, if there be any conſiderable oozing of blood from the veins, it is

proper to expoſe the wound entirely to the air, but without completely taking off the bandage and dreſſings. In caſes of hemorrhage, we are not to employ any poultice, becauſe the flux of blood is increaſed by the heat of it; but, as the blood generally ſtops about the fourth or fifth day, and ſuppuration is then about to take place, we may lay on a large cold poultice over the dreſſings, if they be found to adhere to the edge of the wound. After the dreſſings are completely thrown out, we muſt clean the wound gently with a ſoft moiſt ſponge, and afterwards dreſs with fine charpie, moiſtened in oil, and the whole may be covered with a large thick compreſs, and kept in its place with a proper bandage. This line of conduct is recommended by Mr. Latta, who deſcribes the following caſe of a gun-ſhot wound of a joint.

"In a patient who happened to be under my care for a gun-ſhot wound (ſays he), the bullet had ſtruck and ſhivered to pieces the head of the humerus, paſſing through the body of the joint immediately below the end of the clavicle, paſſing over the brachial artery as it paſſes over the firſt rib below the middle of the ſcapula, juſt below the ſkin, without hurting the artery, and was found lodged below that end of the clavicle which is articulated with the upper part of the ſternum. The ball being cut out, and all the ſhattered pieces of the head of the bone removed, the wound was dreſſed in the manner already directed. The dreſſings were removed on the ſixth day from their firſt application. Slight hemorrhages took place now and then, but were always removed, by keeping the wound ſlightly dreſſed, and expoſed to the air. The patient was kept on a very low diet; and it was obſerved that, on any hemorrhage occurring, the pulſe became firmer, or beat quicker. By carefully dreſſing the wound in this manner, and allowing a nouriſhing diet when the hæmorrhage ſtopped, with ſome good Engliſh porter every day after dinner, he got quite well in two months, and his ſtrength and ſpirits became ſurpriſingly recovered. The ſuppuration continued very plentiful for near three weeks, during which time he took daily five drachms of Peruvian bark in powder, uſing at the ſame time a quart of porter, and a pint of Port wine, together with thirty drops of the elixir of vitriol, in a ſmall teacupful of water, after each doſe of the bark. For the firſt five weeks, he had every night a large anodyne draught at bed-time; and, while the diſcharge of matter continued very copious, the wound was dreſſed twice a-day. It is now ten years ſince he received the ſhot, and he has at this moment the uſe of his fore-arm ſo completely, that he gains his bread as a riband-weaver. But, though we may ſucceed with this kind of treatment where the ſmaller joints are wounded, we cannot expect to do ſo where the cavities of the larger ones, ſuch as the knee or ankle, happen to be laid open. From my own experience in caſes of this kind, as well as the teſtimony of

the beſt chirurgical authors, I am decidedly of opinion that the limb ought to be immediately amputated. In every inſtance that I have ſeen or treated, where an opening is made into the knee joint, either artificially, or by accident, the joint inſtantly ſwelled, and the pain and fever became intolerable; ſo that, unleſs the limb was amputated without loſs of time, the patient muſt have periſhed. In all gun-ſhot wounds then, which penetrate the cavity of any of the large joints, amputation ought to take place as ſoon as poſſible, in the manner hereafter related, both as to the dreſſings and management."

Thus far we have proceeded in the deſcription and treatment of gun-ſhot wounds, according to the generally-received opinions on the ſubject. Greatly paramount, however, to all theſe, may be conſidered the doctrines of the celebrated Mr. HUNTER, who, to abundant experience as an army ſurgeon, brought the aid of very ſuperior genius in diſcuſſing this highly important branch of ſurgery. To his excellent *Treatiſe on* INFLAMMATION we are indebted for the whole of the following remarks.

"Gun-ſhot wounds are made by the projection of hard obtuſe bodies, the greateſt number of which are muſket-balls; for cannon-balls, pieces of ſhells and ſtones from ramparts in ſieges, or ſplinters of wood, &c. when on board of a ſhip in an engagement at ſea, can hardly have their effects ranked among gun-ſhot wounds; they will come in more properly with wounds in general. As the wounds themſelves made by thoſe very different modes will in general differ very conſiderably; any peculiarity that may be neceſſary in the treatment of gun-ſhot wounds, from thoſe made by cannon-balls, ſhells, &c. or even common wounds, will generally belong to thoſe made by muſket-balls.

"The whole of gun-ſhot wounds will come within the definition of accidents. They are a recent violence committed on the body; but they often become the cauſe of, or degenerate into, a thouſand complaints, which are the objects of ſurgery or phyſic, many of which are common to accidents in general, and to many other diſeaſes; of this kind are abſceſſes, ulcerating bones, fiſtulæ; but ſome are peculiar to gun-ſhot wounds, as calculi in the bladder from the ball entering that viſcus, conſumption from wounds in the lungs, which I believe rarely happens; for I cannot ſay I ever ſaw a caſe where ſuch an effect took place. But it is the recent ſtate in which they are diſtinguiſhed, and in which they are to be conſidered as a diſtinct object of treatment.

"Wounds of this kind vary from one another, which will happen according to circumſtances; theſe variations will be in general according to the kind of body projected, the velocity of the body, with the nature and peculiarities of the parts injured. The kind of body projected, I have obſerved, is principally muſket-balls, ſometimes cannon-balls, ſometimes pieces of broken

ſhells, and very often on board of ſhip, ſplinters of wood. Indeed, the effects of cannon-balls on different parts of the ſhip, either the containing parts, as the hull of the ſhip itſelf, or the contained, are the principal cauſes of wounds in the ſailor; for a cannon-ball muſt go through the timbers of the ſhip before it can do more execution than ſimply as a ball (which makes it a ſpent ball), and which ſplinters the inſide of the ſhip very conſiderably, and moves other bodies in the ſhip, neither of which it would do if moving with ſufficient velocity; muſket or cannon-balls ſeldom doing immediate injury to thoſe of that profeſſion. The wounds produced by the three laſt bodies will be more like many common and violent accidents, attended with much contuſion and laceration of parts.

"Gun-ſhot wounds, from whatever cauſe, whether from muſket-ball, cannon-ball, or ſhell, &c. are in general contuſed wounds; from which contuſion there is moſt commonly a part of the ſolids ſurrounding the wound deadened, as the projecting body forced its way through theſe ſolids, which is afterwards thrown off in form of a ſlough, and which prevents ſuch wounds from healing by the firſt intention, or by means of the adheſive inflammation, from which circumſtance moſt of them muſt be allowed to ſuppurate. This does not always take place equally in every gun-ſhot wound, nor in every part of the ſame wound; and the difference commonly ariſes from the variety in the velocity of the body projected; for we find in many caſes, where the ball has paſſed with little velocity, which is often the caſe with balls, even at their entrance, but moſt commonly at the part laſt wounded by the ball, that the wounds are often healed by the firſt intention.

"Gun-ſhot wounds, from the circumſtance of commonly having a part killed, in general do not inflame ſo readily as thoſe from other accidents; this backwardneſs to inflame will be in the proportion that the quantity of deadened parts bears to the extent of the wound: from which circumſtance the inflammation is later in coming on, more eſpecially when a ball paſſes through a fleſhy part with great velocity; becauſe they will be a great deal deadened, in proportion to the ſize of the wound: therefore inflammation in gun-ſhot wounds is leſs than in wounds in general, where the ſame quantity of miſchief has been done; and this, alſo, is in an inverſe proportion to the quantity of the parts deadened, as I have already explained in my introduction to inflammation, viz. that inflammation is leſs where parts are to ſlough, than where parts have been deſtroyed by other means. On the other hand, where the ball has fractured ſome bone, which fracture in the bone has done conſiderable miſchief to the ſoft parts, independent of the ball, then there will be nearly as quick inflammation as in a compound fracture of the ſame bone, becauſe the deadened part bears no proportion to the laceration or wound in general.

"From this circumſtance, of a part being often deadened, a gun-ſhot wound is often not completely underſtood at firſt; for it is at firſt, in many caſes, impoſſible to know what parts are killed, whether bone, tendon, or ſoft part, till the deadened part has ſeparated, which often makes it a much more complicated wound than at firſt was known or imagined; for it very often happens, that ſome viſcus, or a part of ſome viſcus, or a part of a large artery, or even a bone, has been killed by the blow, which does not ſhow itſelf till the ſlough comes away. If, for inſtance, it is a part of an inteſtine that has received a contuſion, ſo as to kill it, and which is to ſlough, a new ſymptom will moſt probably appear from the ſlough's being ſeparated, the contents of the inteſtine will moſt probably come through the wound; and probably the ſame thing will happen when any other containing viſcus is in part deadened; but thoſe caſes will not be ſo dangerous, as if the ſame loſs had been produced at firſt, for by this time all communication will be cut off between the containing and contained parts; nor will it be ſo dangerous as when a conſiderable blood-veſſel is deadened; for in this caſe, when the ſlough comes off, the blood, getting a free paſſage into the wound, as alſo out of it, probably death will immediately follow. If this artery is internal, nothing can be done; if in an extremity, the veſſel may be either taken up, or probably amputation may be neceſſary to ſave the perſon's life; therefore an early attention ſhould be paid to accidents, where ſuch an event is poſſible. In caſe of a bone being deadened, an exfoliation takes place.

"Gun-ſhot wounds are often ſuch as do much miſchief to vital parts, the effects of which will be according to the nature of the parts wounded, and the violence of the wound; and alſo to parts, the ſoundneſs of which are eſſential either to the health of the whole, or to the uſes of the parts wounded; ſuch as ſome viſcus, whoſe contents are voided through the opening, or joints, the diſpoſition of which is ſlow to heal, and whoſe uſes are impeded when healed."

To ſhow how great a variety of circumſtances attends gun-ſhot wounds, Mr. Hunter recites the caſe of an officer in the navy, who was wounded by a piſtol ball, in the right ſide, about the laſt rib. It entered about five inches from the navel, and appeared on the inſide of the ſkin about two inches from the ſpinal proceſs, having paſſed, as he ſuppoſed, among the abdominal muſcles. The only remarkable thing that occurred was, that the cellular membrane for ſome way about the paſſage of the ball was œdematous, and that when the ball was extracted, air came out along with it.

Mr. Hunter ſtates the varieties between one gun-ſhot wound and another to ariſe, in many inſtances, from the difference in the velocity of the body projected. He ſays,

" If the velocity of the ball is small, then the mischief is less in all of them ; there is not so great a chance of their being compounded with fractures of the bones, &c. but if the velocity is sufficient to break the bone it hits, the bone will be much more splintered than if the velocity had been very considerable ; for where the velocity is very great, the ball, as it were, takes a piece out ; however, all this will also vary according to the hardness of the bone. In a hard bone the splinters will be the most frequent.

" When the velocity is small, the direction of the wound produced by the ball will, in common, not be so straight, therefore its direction not so readily ascertained, arising from the easy turn of the ball.

" When the velocity is small, the deadened part or slough is always less ; for with a small velocity, a ball would seem only to divide parts, while when the velocity is great, the contrary must happen ; from this circumstance it is, that the slough is larger at that orifice where the ball enters than where it comes out ; and if the ball meets with a great deal of resistance in its passage through, there will very probably be no slough at all at its exit, which will be therefore only a lacerated wound.

" The greater the velocity of the ball, the cleaner it wounds the parts, so much so as almost to be similar to a cut with a sharp instrument ; from which circumstance it might be imagined, that there should be a smaller slough ; but I suspect, that a certain velocity given to the best cutting instrument, would produce a slough on the cut edges of the divided parts ; for the divided parts not giving way equally to the velocity of the dividing body, must of course be proportionally bruised.

" Gun-shot wounds are attended with less bleeding than most others ; however, some will be attended with this symptom more than others, even in the same part ; this arises from the manner in which the wound is produced : bleeding arises from a vessel being cut or broken ; but the freedom of bleeding arises from the manner in which this is done : if the artery is cut directly across, and it is done by a ball passing with a considerable velocity, it will bleed pretty freely ; if bruised, and in some degree torn, then it will bleed less. When the velocity of the ball is small, the vessels will be principally torn, for they will have time to stretch before the continuity of their parts gives way ; but if it is great, they will bleed more freely, because velocity will make up for want of sharpness.

" According to the velocity of the ball so is the direction. When the velocity is great, the direction of the ball will be in general more in a straight line than when it is small ; for under such circumstances the ball more easily overcomes obstructions, and therefore passes on in its first direction.

" Velocity in the ball makes parts leſs capable of healing, than when it moves with a ſmall velocity; therefore gun-ſhot wounds in pretty thick parts are in general later of healing at the orifice where the ball enters, than at the orifice where it paſſes out, becauſe it becomes in ſome degree a ſpent ball, the part having leſs ſlough, being only torn, which will often admit of being healed by the firſt intention.

" In caſes where the ball paſſes through, and in ſuch a direction as to have one orifice more depending than the other, I have always found that the depending orifice healed ſooneſt, and more certainly ſo if the ball came out that way, and alſo if the ball had been pretty much ſpent in its paſſage, therefore it will require art to keep the depending orifice open, if thought neceſſary; but this circumſtance of its being a ſpent ball will not always happen, becauſe if the perſon is near the gun when fired, the velocity of the ball will be very little diminiſhed in its progreſs through the ſoft parts, and, therefore, it will have nearly the ſame velocity on both ſides.

" This fact of the lower orifice healing ſooneſt is common to all wounds, and, I believe, is owing to the tumefaction which generally ariſes from the extravaſated fluid always deſcending to the lower part, and being retarded at the lower orifice, it is as it were ſtopped there, and preſſes the ſides of the wound together, obliging it to heal, if the parts have not been deadened; this is evidently the caſe after the introduction of the ſeton in the hydrocele, eſpecially if the two orifices of the ſeton are at ſome diſtance; but in the hydrocele there is a more ſtriking reaſon for it, for in this diſeaſe the extravaſated fluids are wholly detained about the lower orifice, as there is no depending part for the fluid to deſcend to."

After enumerating the different kinds of gun-ſhot wounds, which have been ſufficiently ſpoken of in the foregoing pages, he proceeds to ſpeak of the treatment.

" It has been hitherto recommended (he obſerves), and univerſally practiſed by almoſt every ſurgeon, to open immediately upon their being received, or as ſoon as poſſible, the external orifice of all gun-ſhot wounds made by muſket-balls; ſo much has this practice been recommended, that they have made no diſcrimination between one gun-ſhot wound and another; this would appear to have ariſen, and to be ſtill continued, from an opinion that gun-ſhot wounds have a ſomething peculiar to them, and of courſe are different from all other wounds, and that this peculiarity is removed by the opening; I own that I do not ſee any peculiarity. The moſt probable way of accounting for the firſt introduction of this practice is, from the wound in general being ſmall, and nearly of a ſize from one end to the other; alſo the frequency of extraneous bodies being forced into theſe wounds

by the ball, or the ball itself remaining there; for the way in which these wounds are made, is by the introduction of an extraneous body which is left there, if it has not made its way through, so that the immediate cause of the wound makes a lodgment for itself, often carrying before it clothes, and even the parts of the body wounded, such as the skin, &c.; from hence it would naturally appear, at first view, that there was an immediate necessity to search after those extraneous bodies, which very probably led the surgeon to do it; and, in general, the impossibility of finding them, and even of extracting them when found, without dilatation, gave the first idea of opening the mouths of the wounds; but, from experience, they altered this practice in part, and became not so desirous of searching after these extraneous bodies; for they found that it was oftener impossible to find them than could at first have been imagined, and when found that it was not possible to extract them, and that afterwards these bodies were brought to the skin by the parts themselves, and those that could not be brought to the external surface in this way, were such as gave little or no trouble afterwards, such as balls; yet they altered this practice only so far as respected the attempt to extract extraneous bodies, for when they found, from experience, that it was not necessary, nor possible, to extract these immediately, yet they did not see that it therefore was not necessary to take the previous or leading steps towards it.

"The circumstance I have mentioned, of gun-shot wounds being contused, obliges most of them to suppurate, because in such cases there is more or less of a slough to be thrown off, especially at the orifice made by the entrance of the ball; there is, therefore, a freer passage for the matter, or any other extraneous substance, than the same sized wound would have, if made by a clean cutting instrument, even if not allowed to heal by the first intention.

"From all which, if there is no peculiarity in a gun-shot wound, I think this dilating of them as a general practice should be rejected at once, even were it only for this reason, that few gun-shot wounds are alike, and, therefore, the same practice cannot apply to all.

"This treatment of gun-shot wounds is diametrically opposite to a principle which is generally adopted in other cases, although not understood as a general rule, which is, that very few wounds of any kind require surgical treatment at their commencement, excepting with an opposite view from the above, viz. to heal them by the first intention.

"It is contrary to all the rules of surgery, founded on our knowledge of the animal economy, to enlarge wounds simply as wounds; no wound, let it be ever so small, should be made larger, excepting when preparatory to something else, which will imply a complicated wound, and which is to be treated accordingly. It

ſhould not be opened becauſe it is a wound, but becauſe there is ſomething neceſſary to be done, which cannot be executed, unleſs the wound is enlarged."

The author obſerves that this is *common ſurgery*, and ought alſo to be *military ſurgery*, reſpecting the wounds which form the ſubject of his remarks. He proves the inutility of *opening gun-ſhot wounds* as a general practice, by ſhortly reciting the caſes of four Frenchmen and a Britiſh ſoldier, wounded on the day of the landing of the Engliſh army on the iſland of Belliſle. Theſe perſons had nothing at all done to their wounds for four days after receiving them; and, when they were brought to the hoſpital, their wounds were only dreſſed ſuperficially, and they all recovered.

On *the propriety of dilating gun-ſhot wounds* the ingenious author makes the following remarks: "It would (ſays he) be abſurd for any one to ſuppoſe that there is never occaſion to dilate gun-ſhot wounds at all, but it is certain there are very few in which it is neceſſary. It will be impoſſible to determine, by any general deſcription, what thoſe are that ought to be opened, and what thoſe are that ought not; that muſt be left, in a great meaſure, to the diſcretion of the ſurgeon, when once he is maſter of the arguments on both ſides.

"Some general rules may be given with regard to the more ſimple caſes; but with regard to the more complicated, the particular circumſtances of each caſe are the only guide; and they muſt be treated according to the general principles of ſurgery.

"Let us firſt give an idea of the wound that would appear to receive no benefit from being dilated; and, firſt, of the moſt ſimple wounds.—If a ball paſſes through the fleſhy part, where it can hurt no bone in its way, ſuch as the thick of the thigh, I own, in ſuch a ſimple wound, I ſee no reaſon for dilating it, becauſe I ſee no purpoſe that can be anſwered by it, except the ſhortening of the depth of the wound made by the ball, which can be productive of no benefit. If the ball does not paſs through, and is not to be found, opening can be of as little ſervice.

"If the opening in the ſkin ſhould be objected to, as being too ſmall, and thereby forming an obſtruction to the exit of the ſlough, &c. I think that in general it is not; for the ſkin is kept open by its own elaſticity, as we ſee in all wounds; this elaſticity, muſcles, and many other parts, have not; and, in general, the opening made by a ball is much larger than thoſe made by pointed inſtruments; for I have already obſerved, that there is often a piece of the ſkin carried in before the ball, eſpecially if it paſſed with conſiderable velocity, beſides the circular ſlough; ſo that there is really in ſuch caſes a greater loſs of ſubſtance; therefore, whatever matter or extraneous body there is, when it comes to the ſkin, it will find a free paſſage out. Nor does the wound in the ſkin in

general heal ſooner than the bottom; and indeed, in many caſes, not ſo ſoon, becauſe the ſkin is generally the part that has ſuffered moſt.

"However, this is not an abſolute rule, for the ſkin ſometimes heals firſt; but I have found this to be the caſe as often where openings had been made, as in thoſe where they had not; and this will depend upon circumſtances or peculiarities, ſuch as the bottom being at a conſiderable diſtance, with extraneous bodies, and, having no diſpoſition to heal, tending to a fiſtula; and I have obſerved in thoſe caſes, that the wound or opening made by the ſurgeon generally ſkinned to a ſmall hole before the bottom of the wound was cloſed, which brings it to the ſtate it would have been in, if it had not been dilated at all, eſpecially if there are extraneous bodies ſtill remaining; for an extraneous body cauſes and keeps up the ſecretion of matter, or rather keeps up the diſeaſe at the bottom of the wound, by which means the healing diſpoſition of its mouth is in ſome degree deſtroyed."

After ſtating a caſe of this laſt deſcription, Mr. Hunter proceeds thus:—

"If the extraneous bodies are broken bones, it ſeldom happens that they are entirely detached, and, therefore, muſt looſen before they can come away; alſo the bones in many caſes are rendered dead, either by the blow or being expoſed, which muſt exfoliate, and this requires ſome time; for in gun-ſhot wounds, where bones are either bruiſed or broken, there is moſt commonly an exfoliation, becauſe ſome part of the bone is deadened, ſimilar to the ſlough in the ſoft parts.

"A reaſon given for opening gun-ſhot wounds is, that it takes off the tenſion ariſing from the inflammation, and gives the part liberty; this would be very good practice, if tenſion or inflammation were not a conſequence of wounds; or it would be very good practice, if it could be proved that the effects from dilating a part that was already wounded were very different, if not quite the reverſe, of thoſe of the firſt wound; but as this muſt always be conſidered as an extenſion of the firſt miſchief, we muſt ſuppoſe it to produce an increaſe of the effects ariſing from that miſchief; therefore this practice is contradictory to common ſenſe and common obſervation."

Mr. Hunter ſuggeſts, that they are principally the *compound wounds* that require ſurgical operations, and lays down certain precautions which are neceſſary with regard to them.

"As the dilatation of gun-ſhot wounds is a violence, it will be neceſſary (he ſays) to conſider well what relief can be given to the parts or patient by ſuch an operation, and whether without it more miſchief would enſue; it ſhould alſo be conſidered what is the proper time for dilating.

"But it will be almoſt impoſſible to ſtate what wound ought,

and what ought not to be opened; this muſt always be determined by the ſurgeon, after he is acquainted with the true ſtate of the caſe and the general principles; but, from what has been already ſaid, we may in ſome meaſure judge what thoſe wounds are that ſhould be opened, in order to produce either immediate relief, or to aſſiſt in the cure. We muſt have ſome other views than thoſe objected to; we muſt ſee plainly ſomething to be done for the relief of the patient by this opening, which cannot be procured without it, and if not procured, that the part cannot heal, or that the patient, moſt probably, muſt loſe his life.

"The practice to be recommended here will be exactly ſimilar to the common practice of ſurgery, without paying any attention to the cauſe as a gun-ſhot wound.

"One of the principal points of practice will be to determine *at what period of time the dilatation ſhould be made.*

"*Firſt*, if the wound ſhould be a ſlight one, and ſhould require opening, it will be better to do it at the beginning, before inflammation comes on; for the inflammation, in conſequence of both, will be ſlight: but in ſlight caſes dilatation will never be neceſſary, except to allow of the extraction of ſome extraneous body that is near. But if the wound is a conſiderable one, and it ſhould appear, upon conſideration, that you cannot relieve immediately any particular part, or the conſtitution, then you can gain nothing by opening immediately, but will only increaſe the inflammation, and, in ſome caſes, the inflammation ariſing from the accident and opening together may be too much for the patient. Under this laſt circumſtance, it would be more adviſeable to wait till the firſt inflammation ceaſes, by which means the patient will ſtand a much better chance of a cure, if not of his life; therefore it is much better to divide the inflammations. However, it is poſſible that the inflammation may ariſe from ſome circumſtance in the wound, which could be removed by opening it; for inſtance, a ball, or broken bone, preſſing upon ſome part whoſe actions are either eſſential to the life of the part, or the whole, as ſome large artery, nerve, or vital part; in ſuch the caſe will determine for itſelf. On the other hand, it may, in many caſes, be better to remove the whole by an operation, when in ſuch parts as will admit of it.

"*Secondly*, if an artery is wounded, where the patient is likely to become either too weak, or to loſe his life from the loſs of blood, then certainly the veſſel is to be tied, and moſt probably this cannot be done without previouſly opening the external parts, and often very freely.

"Or, *thirdly*, in a wound of the head, where there is reaſon to ſuſpect a fracture of the ſkull, it is neceſſary to open the ſcalp, as in any other common injury done to the head, where there was

reaſon to ſuſpect a fracture; and when opened, if a fracture is found, it is to be treated as any other fractured ſkull.

"*Fourthly*, where there are fractured bones in any part of the body that can be immediately extracted with advantage, and which would do much miſchief if left; this becomes a compound fracture wherever it is; and it makes no difference in the treatment, whether the wound in the ſkin was made by a ball, or the bone itſelf, at leaſt where the compound fracture is allowed to ſuppurate; for there is often a poſſibility of treating a compound fracture as a ſimple one, which gun-ſhot fractures, if I may be allowed the expreſſion, ſeldom will allow of; but, where the compound fracture muſt ſuppurate, there they are very ſimilar. However, there have been inſtances where a fracture of the thigh bone, made by a ball, has healed in the ſame way as a compound ſimple fracture.

"*Fifthly*, where there is ſome extraneous body which can with very little trouble be extracted, and where the miſchief, by delay, will probably be greater than that ariſing from the dilatation.

"*Sixthly*, where ſome internal part is miſplaced, which can be replaced immediately in its former poſition, ſuch as in wounds in the belly, where ſome of the viſcera are protruded, and it becomes neceſſary to perform the operation of gaſtroraphia, which is to be done in this caſe in the ſame manner as if the accident aroſe from any other cauſe; but the treatment ſhould be different, for gun-ſhot wounds cannot heal by the firſt intention, on account of the ſlough that is to enſue.

"Or, *ſeventhly*, when ſome vital part is preſſed, ſo that its functions are loſt or much impaired, ſuch as will often happen from fractures of the ſkull, fractures of the ribs, ſternum, &c.; in ſhort, when any thing can be done to the part after the opening is made for the preſent relief of the patient, or the future good ariſing from it. If none of theſe circumſtances has happened, then I think we ſhould be very quiet. Balls that enter any of the larger cavities, ſuch as the abdomen or thorax, need not have their wounds dilated, except ſomething elſe is neceſſary to be done to the contained parts, for it is impoſſible to follow the ball, therefore they are commonly not opened, and yet we find them do very well.

"Balls that enter any part where they cannot be followed, ſuch as into the bones of the face, need not have the wound in the ſkin in the leaſt enlarged, as it can give no aſſiſtance to the other part of the wound, which is a bony canal."

In proof of this Mr. Hunter relates the following caſes:

Case I. "An officer, who was wounded in the cheek by a ball, had all the ſymptoms of an injured brain: upon examining the parts, I found that the ball had paſſed directly backwards

through the cheek-bone; therefore, from the ſymptoms, and from the direction of the wound, I ſuſpected that the ball had gone through the baſis of the ſkull into the brain, or at leaſt had produced a depreſſion of the ſkull there; I enlarged the external wound, and with my fingers could feel the coronoid proceſs of the lower jaw; I found that the ball had not entered the ſkull, but had ſtruck againſt it about the temporal proceſs of the ſphenoid bone, which it had broke, and afterwards paſſed down on the inſide of the lower jaw. With ſmall forceps I extracted all I could of the looſe pieces of bone; he ſoon recovered from his ſtupor, and alſo from his wound. The ball afterwards cauſed an inflammation at the angle of the lower jaw, and was extracted. The good which I propoſed by opening and ſearching for extraneous bodies and looſe pieces of bone was the relieving of the brain; but, as the ball had not entered the ſkull, and as none of the bones had been driven into the brain, it is moſt probable that I did no good by my opening; but that I could not foreſee."

Case II. "An officer received a wound by a ball in the cheek (which in this caſe was on the oppoſite ſide), the wound led backwards, as in the other; by putting my finger into the wound I felt the coronoid proceſs of the lower jaw, as in the former, but he had no ſymptoms of an injured brain; I therefore adviſed not to open it, becauſe the reaſon for opening in the preceding caſe did not exiſt here; my adviſe was complied with, and the wound did well, and rather better than the former, by healing ſooner. The ball was never found, ſo far as I know."

"The preſent practice (continues the author) is not to regard the balls themſelves, and ſeldom or ever to dilate upon their account, nor even to ſearch much after them when the wound is dilated, which ſhews that opening is not neceſſary, or at leaſt not made upon account of extraneous bodies.

"This practice has ariſen from experience; for it was found that balls, when obliged to be left, ſeldom or ever did any harm when at reſt, and when not in a vital part; for balls have been known to lie in the body for years, and are often never found at all, and yet the perſon has found no inconvenience.

"This knowledge of the want of power in balls to promote inflammation when left in the body, aroſe from the difficulty of finding them, or extracting them when found; and, therefore, in many caſes they were obliged to leave them.

"One reaſon for not readily finding the ball at firſt is, becauſe the parts are only torn and divided, without any loſs of ſubſtance (till the ſlough comes off), by which means the parts collapſe and fall into their places again, which makes it difficult to paſs any thing in the direction of the ball, or even to know its direction. The different courſes they take, by being turned aſide by ſome reſiſting body, add alſo to the difficulty, as will be explained.

" But the courſe of the ball, if not perpendicular, but paſſing obliquely, and not very deep, a little way under the ſkin, probably an inch or more, is eaſy to be traced through its whole courſe, for the ſkin over the whole paſſage of the ball generally is marked by a reddiſh line. I have ſeen this redneſs, even when the ball has gone pretty deep; it has none of the appearances of inflammation, nor of extravaſation, for extravaſation is of a darker colour, and what it is owing to I have not been able to diſcover. I can conceive it to be ſomething ſimilar to a bluſh, only the ſmall veſſels allowing the red particles of the blood to flow more eaſily."

After ſome curious inſtances of the wonderful effect of oblique reſiſtance in altering the courſe of a ball, and an account of the circumſtances to be attended to in the ſurgeon's endeavours to obtain a knowledge of its preciſe ſituation, Mr. Hunter proceeds to obſerve, that

" Theſe *uncertainties in the direction of the ball* have made the common bullet forceps almoſt uſeleſs; yet forceps are not to be entirely thrown aſide, for it will often happen that a ball will be found to lie pretty near the external wound, which, if the ball was removed, would heal probably by the firſt intention; for in ſuch ſuperficial wounds they muſt have paſſed with little velocity, or, if there was a part killed, it would heal immediately; but if there is a ſlough, this is beſt done after all inflammation, and the ſeparation of the ſlough is over, for then the paſſage of the ball is better aſcertained, in conſequence of the ſurrounding adheſive inflammation; and, moreover, the granulations are beginning to puſh the extraneous body towards the ſurface; but the operation of ulceration, which brings it to the ſkin, being often too ſlow, the ball, &c. had better be extracted, and even the part might be dilated. However, I would be very cautious how far I carried this practice, and only do it when all circumſtances favoured.

" For the ſame reaſons probes are become of little uſe; indeed, I think that they ſhould never be uſed but by way of ſatisfaction, in knowing ſometimes what miſchief is done; we can, perhaps, feel if a bone is touched, or if a ball is near, &c.; but when all this is known, it is an hundred to one if we can vary our practice in conſequence of it. If the wound will admit of it, the finger is the beſt inſtrument.

" In caſes where the ball paſſes a conſiderable way under the ſkin, and near to it, I think it would be adviſeable to make an opening midway between the two orifices which were made by the ball (eſpecially when the orifices are at a very great diſtance), that fractured bones, or extraneous bodies, may now or hereafter be better extracted; for if this is not done, we have often an abſceſs forming between them, which, indeed, anſwers the ſame purpoſe, and often better, but ſometimes it ſhould not be delayed for ſuch an event to take place.

" Where the ball has paſſed immediately under the ſkin, as in the caſe where the ball paſſes between the ſkin and tibia, it will be often proper to open the whole length of the paſſage of the ball, the neceſſity of which I think ariſes from the ſkin not ſo readily uniting with the parts underneath, as muſcles do with one another.

" Although we have given up, in a great meaſure, the practice of ſearching after the ball, broken bones, or any other extraneous bodies, yet it often happens that a ball ſhall paſs on till it comes in contact with the ſkin of ſome other part, and where it can be readily felt; the queſtion is, Should ſuch a ball be cut out? If the ſkin is bruiſed by the ball coming againſt it, ſo that we may imagine that this part will ſlough off, in that caſe I ſee nothing to hinder opening it, becauſe the part is dead; therefore no more inflammation can ariſe from the opening than otherwiſe would take place upon allowing the ſlough to be thrown off; while, on the other hand, I ſhould alſo ſuppoſe as little good to ariſe from it, becauſe the ball will come out of itſelf when the part ſloughs off; however, it may be ſuſpected, that before the ſlough falls off, the ball may ſo alter its ſituation, that it will be impoſſible to extract it by that opening; nevertheleſs, I ſhould very much ſuſpect the ball altering its courſe under ſuch circumſtances, for, if the ſkin was ſo much bruiſed as to ſlough, inflammation would ſoon come on, and confine the ball to that place; and yet it always gives comfort to the patient to have the ball extracted. But if the ball is only to be felt, and the ſkin quite ſound, I would in that caſe adviſe letting it alone, till the wound made by the entrance of the ball had inflamed and was ſuppurating. My reaſons for it are theſe:

" *Firſt*, we find that moſt wounds get well when the ball is left in (excepting it has done other miſchief than ſimply paſſing through the ſoft parts), and that very little inflammation attends the wound where the ball lodges, only that where it enters, the inflammation not ariſing ſo much from the injury done by the ball, as from the parts being there expoſed to the ſuppurative inflammation, if it is immediately removed. There is always a greater chance of a ſlough where the ball enters than where it reſts, ariſing from the greater velocity of the ball; for, beyond where the ſlough is, the parts unite by the firſt intention.

" *Secondly*, in thoſe caſes where the ball paſſes through and through we have two inflammations, one at each orifice; inſtead of the one at the entrance, or a continued inflammation through and through, if the ball has paſſed with great velocity. Where the ball makes its exit, the inflammation paſſes further along the paſſage of the ball, than when the wound has been healed up to the ball, and it is cut out afterwards; ſo that by opening imme-

diately, the irritation will be extended further, and, of courſe, the diſpoſition for healing will be prevented.

"If this is the caſe, I think that two wounds ſhould not be made at the ſame time; and what convinces me more of it is, that I have ſeen caſes where the balls were not found at firſt, nor even till after the patients had got well of their wounds; and theſe balls were found very near the ſkin. They gave no trouble, or elſe they would have been found ſooner; no inflammation came upon the parts, and they were afterwards extracted and did well.

"Again, I have ſeen caſes where the balls were found at firſt, and cut out immediately, which were ſimilar to balls paſſing through and through; the ſame inflammation came on the cut wounds that came on the wounds made by the entrance of the ball."

Penetrating gun-ſhot wounds of the abdomen, Mr. Hunter obſerves, become more or leſs dangerous, according to the miſchief done to the contents of the cavity into which they enter.

"Theſe wounds (ſays he) may be diſtinguiſhed according as they are ſimply penetrating, without extending to the contained parts, or as they affect theſe parts; and the event of theſe two kinds of wounds is very different; for in the firſt, little danger is to be expected, if properly treated; but in the ſecond, the ſucceſs will be very uncertain, for very often nothing can be done for the patient under ſuch wounds, and very often a good deal of art can be made uſe of with advantage.

"Wounds of the parietes of the abdomen, not immediately inflicted on ſuch a viſcus as has the power of containing other matter, will in general do well, let the inſtrument that made the wound be what it will. There will be a great difference, however, ſhould that inſtrument be a ball paſſing with great velocity, for in this caſe a ſlough will be produced. But if it ſhould paſs with little velocity, then there will be leſs ſloughing, and the parts will, in ſome degree, heal by the firſt intention, ſimilar to thoſe made by a cutting inſtrument; but although the ball has paſſed with ſuch velocity as to produce a ſlough, yet that wound ſhall do well, for the adheſive inflammation will take place on the peritonæum all round the wound, which will exclude the general cavity from taking part in the inflammation, although the ball has not only penetrated, but has wounded parts which are not immediately eſſential to life, ſuch as the epiploon, meſentery, &c. and perhaps gone quite through the body; yet it is to be obſerved, that wherever there is a wound, and whatever ſolid viſcus may be penetrated, the ſurfaces in contact, ſurrounding every orifice, will unite by the adheſive inflammation, ſo as to exclude entirely the general cavity, by which means there is one continued canal wherever the ball or inſtrument has paſſed; or if any extraneous

body ſhould have been carried in, ſuch as clothes, &c. they will alſo be included in theſe adheſions, and both theſe and the ſlough will be conducted to the external ſurface by either orifice.

" All wounds that enter the belly, which have injured ſome viſcus, are to be treated according to the nature of the wounded part, with its complications; which will be many, becauſe the belly contains more parts of very diſſimilar uſes than any other cavity in the body, each of which will produce ſymptoms peculiar to itſelf, and the nature of the wound.

" The wounding of the ſeveral *viſcera* will often produce what may be called immediate and ſecondary ſymptoms, which will be peculiar to themſelves, beſides what are common to ſimple wounds, ſuch as bleeding, which is immediate, and inflammation and ſuppuration, which are ſecondary. Senſations alone will often lead to the viſcus wounded, and this is frequently one of the firſt ſymptoms.

" The immediate ſymptoms ariſing from wounds in the different viſcera are as follows: From a *wound in the liver* there will be pain in the part, of the ſickly or depreſſing kind; and, if it is in the right lobe, there will be a deriſive pain in the right ſhoulder; or in the left ſhoulder, from a wound in the left lobe. A *wound in the ſtomach* will produce great ſickneſs and vomiting of blood, and ſometimes a delirium; a caſe of which I once ſaw in a ſoldier in Portugal, who was ſtabbed into the ſtomach with a ſtiletto.

" Blood in the ſtools will ariſe from a wound in the inteſtines, and according to the inteſtine wounded it will be more or leſs pure; if the blood is from a high part of an inteſtine, it will be mixed with fæces, and of a dark colour; if low, as the colon, the blood will be leſs mixed, and give the tinge of blood; and the pain or ſenſation will be more or leſs acute, according to the inteſtine wounded: more of the ſickly pain, the higher the inteſtine, and more acute the lower. There will be bloody urine from a wound in the kidneys or bladder; and if cauſed by a ſhot or ball, and a lodgment made, theſe bodies will ſometimes become the cauſe of a ſtone. The ſenſation will be trifling.

" A *wound of the ſpleen* will produce no ſymptoms that I know of, excepting, probably, ſickneſs, from its connection with the nerves belonging to the ſtomach, &c."

Some extravaſation of blood, Mr. Hunter obſerves, will take place in all penetrating wounds, and more eſpecially if ſome viſcus is wounded; and this muſt prove dangerous, or not, according to the quantity loſt.

" Theſe (continues he) are the immediate and general ſymptoms upon ſuch parts being wounded, but other ſymptoms may ariſe, in conſequence of ſome of thoſe viſcera being wounded, which require particular attention. There may be wounds of the

liver and ſpleen, which produce no ſymptoms but what are immediate, and may ſoon take on the healing diſpoſition; but wounds in thoſe viſcera which contain extraneous matter, ſuch as the ſtomach, inteſtines, kidneys, ureters, and bladder, may produce ſecondary ſymptoms of a diſtinctive kind. If the injury is done by a ball to any of thoſe viſcera, the effect may be of two kinds; one where it makes a wound, as ſtated above, the other where it only produces death in a part of one of them; theſe will produce very different effects: the firſt will moſt probably be always dangerous, the ſecond will hardly ever be ſo. The firſt is, where the ball has wounded ſome one of the above-mentioned viſcera in ſuch a manner, as not to produce the ſymptoms already deſcribed, but produce one common to them all, viz. their contents or extraneous matter immediately eſcaping into the cavity of the abdomen. Such caſes will ſeldom or ever do well, as this effect will hinder the above-mentioned adheſions taking place. The conſequence of this will be, that univerſal inflammation on the peritonæum will take place, with great pain, and tenſion, and ending fatally. But all this will be in proportion to the quantity of wound in the part, and quantity of contents capable of eſcaping into the cavity of the abdomen; for if the wound is ſmall, and the bowels not full, then adheſions may take place all round the wound, which will confine the contained matter, and make it go on in its right channel."

To ſhew that *adheſions may take place very early*, Mr. Hunter relates a very intereſting caſe, deſcribes the treatment, and applies ſeveral ingenious queries to thoſe circumſtances that appeared difficult of explanation. Theſe the reader would do well to conſult in the Treatiſe on Inflammation; a ſubſequent caſe we ſhall relate in the author's words, together with the remarks which introduce it.

Speaking of parts that have been only *deadened*, Mr. Hunter ſays,

"Wounds will be very ſimilar to the above-ſtated penetrating wounds, but they will differ from them in effects, ariſing from a ſlough ſeparating from a containing viſcus; for, whenever the ſlough comes away, the extraneous or contained matter of that viſcus will eſcape by the wound; ſuch as the contents of the ſtomach, inteſtines, ureters, bladder, &c. the two laſt of which will be ſimilar, or the ſlough may eſcape by either of theſe outlets; whereas, in the laſt kind of wounds, any of the contents that could poſſibly eſcape would immediately paſs into the cavity of the abdomen.

"The periods of theſe ſymptoms appearing after the accident will be according to the time of ſeparation, which may be in eight, ten, twelve, or fourteen days.

"This new ſymptom, although in general very diſagreeable, will not be dangerous (how far the contents of the ſtomach eſcap-

ing through a wound might not be attended with bad consequences, Mr. Hunter is undecided), for all the danger is over before it can appear; but that the orifice ſhould afterwards continue, and become either an artificial anus, or urethra, is a thing to be avoided, though they commonly cloſe up, and the contents are directed the right way; in ſuch caſe nothing is to be done, but dreſſing the wound ſuperficially, and when the contents of the wounded viſcus become leſs, we may hope for a cure."

The following caſe is propoſed to explain the foregoing remarks.

"A young gentleman was ſhot through the body. The muſket was loaded with three balls, but there were only two orifices where they entered, and alſo only two where they came out, one of the balls having followed one of the others; that there were three that went through him was evident, for they afterwards made three holes in the wainſcot behind him, but two very near one another.

"The balls entered upon the left ſide of the navel, one a little farther out than the other, and they came out behind, pretty near the ſpinal proceſſes, about the ſuperior vertebræ of the loins. From the cloſeneſs of the gun to the man when fired, which of courſe made it paſs with great velocity, as alſo from the direction of the innermoſt, which we ſuppoſed to be the double one, we were pretty certain that it had penetrated the cavity of the abdomen, but could not be ſo certain of the courſe of the other.

"The firſt water he made after the accident was bloody, from which we knew the kidney was wounded; but that ſymptom ſoon left him. He had no blood in his ſtools, from which we concluded that none of the inteſtines were wounded; and no ſymptoms of extravaſation of the contents of any viſcus taking place, ſuch as the ſymptoms of inflammation of the peritonæum, we were ſtill more confirmed in our opinion.

"The ſymptomatic fever did not run higher than could have been expected, nor was there more pain in the track of the ball than might be imagined.

"Theſe conſequent ſymptoms of the immediate injury abated as ſoon as could be expected, and in leſs than a fortnight I pronounced him out of danger from the wound; for, no immediate ſecondary ſymptoms having taken place, I concluded, that whatever cavities the balls had entered, there the ſurrounding parts had adhered, ſo that the paſſage of the ball was, by this means, become a complete canal; and, therefore, that neither any extraneous bodies that had been carried in with the balls, and had not been carried through, nor any ſlough that might ſeparate from the ſides of the canal, nor the matter formed in it, could now get into the cavity of the abdomen, but muſt be conducted to the external ſurface of the body, either through the wounds, or from an

abſceſs forming for itſelf, which would work its own exit ſomewhere.

"But this concluſion was ſuppoſed to be too haſty, and ſoon after a new ſymptom aroſe, which alarmed thoſe who did not ſee the propriety of my reaſoning, which was ſome fæces coming through the wound; this new ſymptom did not alter my opinion, reſpecting the whole operations of nature to ſecure the cavity of the abdomen, but it confirmed it (if a further confirmation had been neceſſary), and, therefore, I conceived it could not affect life; but, as I ſaw the poſſibility of this wound becoming an artificial anus, I was ſorry for it. It was not difficult to account for the cauſe of this new ſymptom; it was plain that an inteſtine (the deſcending part of the colon moſt probably), had only received a bruiſe from the ball, but ſufficient to kill it at this part, and till the ſeparation of the ſlough had taken place, that both the inteſtine and canal were ſtill complete, and, therefore, did not communicate with each other; but when the ſlough was thrown off, the two were laid into one at this part, therefore the contents of the inteſtine got into the wound, and the matter from the wound might have got into the inteſtine. However, this ſymptom gradually decreaſed by (we may ſuppoſe) the gradual contraction of this opening, an entire ſtop to the courſe of the fæces took place, and the wounds healed very kindly.

"But the inflammation, the ſympathetic fever, the reducing treatment, and the ſpare regimen, all tended to weaken him very much."

Mr. Hunter next takes up the ſubject of *penetrating wounds in the cheſt*. After obſerving that little notice has been taken of wounds in the cheſt and lungs, on a ſuppoſition that little or nothing could be done, he combats this ill-grounded concluſion in the following terms:

"It is pretty well known (ſays he), that wounds of the lungs, abſtracted from other miſchief, are not mortal. I have ſeen ſeveral caſes where the patient has got well after being ſhot quite through the body and lungs, while from a very ſmall wound made by a ſword or bayonet into the lungs, the patient has died; from which I ſhould readily ſuppoſe, that a wound in the lungs from a ball would in general, do better than a wound in the ſame part with a pointed inſtrument; and this difference in effects would appear, in many caſes, to ariſe from the difference in the quantity of blood extravaſated, becauſe the bleeding from a ball is very inconſiderable, in compariſon to that from a cut, and there is, therefore, a leſs chance of extravaſated blood, either in the cavity of the thorax, or the cells of the lungs. Another circumſtance that favours the gun-ſhot wounds in theſe parts is, that they ſeldom heal up externally by the firſt intention, on account of the ſlough, eſpecially at the wound made by the entrance of the ball,

ſo that the external wound remains open for a conſiderable time, by which means any extravaſated matter may eſcape; but even this has often its diſadvantages, for, by keeping open the external wound which leads into the cavity, we give a chance to produce the ſuppurative inflammation through the whole ſurface of that cavity, which moſt probably would prove fatal, and which would be equally ſo if no viſcus was wounded; but it would appear that the cavity of the thorax does not ſo readily fall into this inflammation from a gun-ſhot wound as we ſhould at firſt imagine; nor can we ſuppoſe that the adheſive inflammation readily takes place between the lungs and pleura round the orifice, as we deſcribed in the wounds of the abdomen, becauſe theſe parts are not under the ſame circumſtances that other contained, and containing, parts are; for in every other caſe, the contained and containing have the ſame degree of flexibility, or proportion in ſize. The brain and the ſkull have not the ſame flexibility, but they bear the ſame proportion in ſize. From this circumſtance, the lungs immediately collapſe, when either wounded themſelves, or when a wound is made into the cheſt, and not allowed to heal by the firſt intention, and become by much too ſmall for the cavity of the thorax, which ſpace muſt be filled either with air or blood, or both, therefore adheſion cannot readily take place; but it very often happens that the lungs have previouſly adhered, which will frequently be an advantage.

" In the caſes of ſtabs, eſpecially if with a ſharp inſtrument, the veſſels will bleed freely, but the external wound will collapſe, and cut off all external communication. If the lungs are wounded in the ſame manner, we muſt expect a conſiderable bleeding from them; this bleeding will be in the general cavity of the thorax (if the lungs at this part have not previouſly adhered there), and likewiſe into the cells of the lungs or bronchea, which will be known by producing a cough, and in conſequence of it a bleeding at the mouth; for the blood that is extravaſated into the air-cells of the lungs will be coughed up by the trachea, and by that means will become a certain ſymptom of the lungs being wounded; but that which gets into the cavity of the thorax cannot eſcape, and, therefore, muſt remain till the abſorbents take it up; which they will do, if it is only in ſmall quantity; but if in large quantity, this extravaſated blood will produce ſymptoms of another kind.

" The ſymptoms of theſe accidents are,

" *Firſt*, a great lowneſs, which proceeds from the nature of the parts wounded, and perhaps a fainting from the quantity of blood loſt to the circulation; but this will be in proportion to the quantity and quickneſs with which it was loſt. A load in the breaſt will be felt, but more from a ſenſation of this kind than from any real weight, and a conſiderable difficulty in breathing.

" This difficulty in breathing will ariſe from the pain the patient will have in expanding the lungs in inſpiration, and will alſo pro-

ceed from the muſcles of reſpiration of that ſide being wounded, and this will continue for ſome time, from the ſucceeding inflammation; it will hinder the expanſion of the thorax on that ſide, and of courſe in ſome degree of the other ſide, as we have not the power of raiſing one ſide without raiſing the other; and if wounded by a cutting inſtrument, the lungs of that ſide not being able to expand fully, by the cavity of the thorax being in part filled with blood, will alſo give the ſymptoms of difficulty of breathing.

"The patient will not be able to lie down, but muſt ſit upright, that the poſition may allow of the deſcent of the diaphragm, to give room in the cheſt."

All theſe ſymptoms are ſtrongly illuſtrated in the caſe of a patient, who had received a ſtab in the breaſt from a ſmall ſword. He proceeds afterwards thus:

"Wounds in the lungs generally become a cauſe of a *quick pulſe*; this likewiſe may ariſe, in ſome degree, from the lungs being ſo immediately concerned in the circulation, that any thing that gives a check to the blood's free motion through them may affect the heart; but the pulſe becomes hard, which ariſes from the nature of the inflammation that attends, and alſo from the wound being in a vital part.

"In the caſes ariſing from balls, nothing in general is to be done but to keep quiet, and dreſs the wounds ſuperficially, for any extravaſated blood that might have got into the cavity of the thorax will generally make its eſcape by the external wound, as alſo any matter from ſuppuration. But in the caſes of wounds made by cutting inſtruments, and where there is reaſon to ſuſpect a conſiderable quantity of blood in the cavity of the thorax, then we may aſk, what ſhould be done? and the natural anſwer is, that the *operation for the empyema* ſhould be performed. This operation will relieve the patient, and bring the diſeaſe to the ſimple wound, and ſomewhat nearer to the gun-ſhot wound; it ſhould be performed as ſoon as poſſible, before the blood can have time to coagulate, for the coagulum of the blood may be with difficulty extracted."

The author paſſes over the ſubject of *concuſſion and fracture of the ſkull* from a muſket-ball, as differing in nothing from the ſame accidents ariſing from other cauſes, except in the lodgment of the ball, which he imagines would require no peculiar mode of treatment. He next remarks on gun-ſhot wounds of a compound deſcription.

"The *compound gun-ſhot wounds* (ſays he), where bones are broke, or where there are extraneous bodies that continue the irritation, ſimilar to compound fractures, ſeldom or ever heal at once, or by regular degrees, as in the former, but generally heal very quick at firſt, upon the going off of the inflammation, ſimilar to the healing of ſimple gun-ſhot wounds; but, when healed ſo far as to be affected by the extraneous bodies, then they become

flow in their progreſs, till at laſt they come to a ſtand, or become fiſtulous, in which ſtate they continue till the irritating cauſe is removed; and this takes place even if the dilatation ſhould have been made at firſt as large as could be thought neceſſary; ſo that the opening at firſt, in ſuch caſes, can only let out thoſe extraneous bodies, or detached bones, that are perfectly looſe, or become looſe while the wound continues large; however, even this can only take place in ſuperficial wounds; but in thoſe that are deep, or where there is an exfoliation to take place, the dilated part always heals up long before they are fit to make their exit; but before this happens, the parts often acquire an indolent diſeaſed ſtate, and, even when all extraneous bodies are extracted, the parts do not readily heal.

"When a wound comes to this ſtage, ſurgeons generally put in ſponge or other tents into the opening, or apply ſome corroding medicine to keep it open, and alſo with a view to make it wider; but this practice is unneceſſary, as a wound in ſuch a ſtate ſeldom heals entirely over, nor do tents add much to the width of the wound, and always confine the matter between the two dreſſings.

"Where an *exfoliation* is expected, it is generally better to expoſe as much of the bone as poſſible; it keeps up a kind of inflammation, which I imagine gives a diſpoſition for this proceſs. This can be only done where the bone is pretty ſuperficial; but in caſes where the ſeparation has already taken place, and it is now to make its way to the ſkin like any other extraneous ſubſtance, then, inſtead of the practice of ſponge tents to keep the orifice in the ſkin open, it would be often better in ſuch caſes to let the whole heal over, becauſe the extraneous body would form an abſceſs round itſelf, which would enlarge the cavity, and produce the ulcerative inflammation quicker towards the ſurface, and when that was opened, the extraneous body could be with more eaſe extracted, or would come out of itſelf; but this method of healing the mouths of fiſtulous ſores is not always practicable.

"If this laſt practice has no inconveniences attending it, it has this advantage, that the patient has not the diſagreeable trouble of having a ſore to dreſs every day, till the extraneous body comes away, which I think is no ſmall conſideration. This practice, however, is not to be followed in every caſe; for inſtance, if the wound ſhould communicate with a joint, as is common to moſt ſores in the foot and hand, where the bones are diſeaſed, it would be, in ſuch caſes, very imprudent to allow the wound to heal, as the confined matter would get more readily into the different joints, and increaſe the diſeaſe; there may be other cauſes to forbid this, as a general practice.

"If wounds are to be kept open at their mouths, whoſe bottoms have not a diſpoſition to heal, they ſhould be kept open to

that bottom, becauſe, whenever they do heal at their mouths, it is moſt commonly owing to their ſides underneath firſt uniting, for the ſkin will ſeldom unite when all beyond it is open.

" In wounds that become *fiſtulous*, where there is no extraneous body, there is always a diſeaſed bottom, which is to be looked upon as having the ſame effect as an extraneous ſubſtance. To alter this diſeaſed diſpoſition, they ſhould be opened freely, as large openings produce quick inflammation, quick ſuppuration, and quick granulations, which are generally found when they ariſe from ſuch a cauſe; on the other hand, letting ſuch wounds heal at their mouths has often a ſalutary effect, as it becomes a means of deſtroying this diſeaſed part by the formation of an abſceſs there, and in general there can be no better way of coming at a part or extraneous body, than by the formation of an abſceſs there. It is a natural way of opening to relieve diſeaſed parts; but we often find in practice, that this method is not ſufficient, either for the extraction of extraneous bodies, or to expoſe the diſeaſed bottom, excepting theſe abſceſſes are opened very largely by art, ſo as to expoſe the whole of the diſeaſed parts or extraneous body."

The *time proper for removing incurable parts* is the ſubject which next comes under Mr. Hunter's conſideration.

" Many gun-ſhot wounds (ſays he) are at the very firſt evidently incurable, whether in a part that cannot be removed, or in one that will admit of being removed. When ſuch wounds are in parts that will not admit of a removal of the parts injured, then nothing can be done by ſurgery; but when in a part that can be removed, then a removal of the injured part is to be put in practice; but even this is to be under certain reſtrictions; perhaps it ſhould not be done immediately upon the receiving of the injury, excepting where a conſiderable blood-veſſel is wounded, ſo as to endanger the life of the perſon, and that it abſolutely cannot be taken up; or it is ſuſpected that the inflammation, in conſequence of the accident, will kill, by which means you have only the inflammation in conſequence of the amputation; but this is a bad reſource, eſpecially if it is a lower extremity that is to be amputated, and which is, perhaps, the only part that can be removed of which the inflammation will kill.

" How far the ſame practice is to be followed in caſes which we may ſuppoſe will not kill; but that the part is ſo hurt, as to all appearance not to be in the power of ſurgery to ſave, I will not now determine. This is a very different caſe from the former, and its conſequences depend more upon contingences, ſo that the part ſhould be removed only when the ſtate of the patient in other reſpects will admit of it; but this is ſeldom the caſe, for few people in full health are in that ſtate, and ſtill leſs ſo thoſe who are uſually the ſubjects of gun-ſhot wounds. The ſituation they are in at the time, from the hurry of mind, makes it here in general to be

the very worſt practice; it will in general, therefore, be much better to wait till the inflammation, and all the effects of both the irritation and inflammation ſhall be gone off.

"If theſe things are not ſufficiently attended to, and the firſt inflammation, as in the firſt ſtated caſe (for inſtance, that which is likely to prove mortal), is allowed to go on, the patient will moſt probably loſe his life; or if the firſt inflammation is ſuch as is likely to go off, according to the laſt ſtated caſe, then we ſhould allow it to go off before we operate, and not run the riſk of producing death by an operation; for I have already obſerved, few can ſupport the conſequences of the loſs of a lower extremity when in full health and vigour: we know that a violent inflammation will, in few hours, alter the healthy diſpoſition, and give a turn to the conſtitution, eſpecially if a conſiderable quantity of blood has been loſt, which moſt probably will be the caſe where both accident and operation immediately ſucceed one another. The patient under ſuch circumſtances becomes low, ſimply by the animal life loſing its power, and hardly ever recovers afterwards."

Having conſidered the curative treatment of gun-ſhot wounds, and other accidents common to the ſoldier and ſailor, Mr. Hunter further conſiders the treatment of thoſe patients, whoſe wounds, at the very firſt, appear to be incurable, when they are in parts that will admit of being removed by an operation.

"Amputation of an extremity (ſays he) is almoſt the only operation that can, and is performed immediately on receiving the injury.

"As theſe injuries in the ſoldier are generally received at a diſtance from all care, excepting what may be called chirurgical, it is proper we ſhould conſider how far the one ſhould be practiſed without the other. In general, ſurgeons have not endeavoured to delay it till the patient has been houſed, and put in the way of a cure; and, therefore, it has been a common practice to amputate on the field of battle: nothing can be more improper than this practice, for the following reaſons: In ſuch a ſituation it is almoſt impoſſible for a ſurgeon, in many inſtances, to make himſelf ſufficiently maſter of the caſe, ſo as to perform ſo capital an operation with propriety; and it admits of diſpute, whether at any time, and in any place, amputation ſhould be performed before the firſt inflammation is over. When a caſe is ſo violent as not to admit of a cure in any ſituation, it is a chance if the patient will be able to bear the conſequent inflammation; therefore, in ſuch a caſe it might appear, at firſt ſight, that the beſt practice would be to amputate at the very firſt; but if the patient is not able to ſupport the inflammation ariſing from the accident, it is more than probable he would not be able to ſupport the amputation and its conſequences: on the other hand, if the caſe is ſuch as will admit of being brought through the firſt inflammation,

although not curable, we ſhould certainly allow of it, for we may be aſſured, that the patient will be better able to bear the ſecond.

" If the chances are ſo even, where common circumſtances in life favour the amputation, how muſt it be where they do not? how muſt it be with a man, whoſe mind is in the height of agitation, ariſing from fatigue, fear, &c.? Theſe circumſtances muſt add greatly to the conſequent miſchief, and caſt the balance much in favour of forbearance.

" If it ſhould be ſaid that, agreeable to my argument, the ſame circumſtances of agitation will render the accident itſelf more dangerous? I anſwer, that the amputation is a violence ſuperadded to the injury, therefore heightens the danger, and when the injury alone proves fatal, it is by ſlower means.

" In the firſt caſe it is only inflammation; in the ſecond, it is inflammation, loſs of ſubſtance, and moſt probably loſs of more blood, as it is to be ſuppoſed that a good deal has been loſt from the accident, not to mention the awkward manner in which it muſt be done.

" The only thing that can be ſaid in favour of amputation on the field of battle is, that the patient may be moved with more eaſe without a limb, than with a ſhattered one; however, experience is the beſt guide; and I believe it is univerſally allowed by thoſe whom we are to eſteem the beſt judges, thoſe who have had opportunity of making comparative obſervations with men who have been wounded in the ſame battle, ſome where amputation had been performed immediately, and others where it had been left till all circumſtances favoured the operation; it has been found that few did well who had their limbs cut off on the field of battle, while a much greater proportion have done well, in ſimilar caſes, who were allowed to go on till the firſt inflammation was over, and underwent amputation afterwards.

" There will be exceptions to the above obſervations, which muſt be, in a great meaſure, left to the diſcretion of the ſurgeon; but a few of theſe objections may be mentioned, ſo as to give a general idea of what is meant.

" *Firſt*, it is of leſs conſequence whichſoever way it is treated, if the part to be amputated is an upper extremity; but it may be obſerved, that there will be little occaſion in general to amputate an upper extremity upon the field, becauſe there will be leſs danger in moving ſuch a patient, than if the injury had happened to the lower.

" *Secondly*, if the parts are very much torn, ſo that the limb only hangs by a ſmall connection, then the circumſtance of the loſs of ſo much ſubſtance to the conſtitution cannot be an objection, as it takes place from the accident, and, indeed, every thing that can poſſibly attend an amputation; therefore, in many caſes, it may be more convenient to remove the whole. In certain caſes

it may be neceſſary to perform the operation to get at blood-veſſels, which may be bleeding too freely, for the ſearching after them may do more miſchief than the operation.

" It will alſo be immediately neceſſary on the field to replace many parts that would deſtroy the patient if their reſtoration was delayed, ſuch as the bowels or lungs protruding out of their cavities; to remove large bodies, ſuch as a piece of ſhell ſticking in the fleſh, which would give great pain, and do miſchief by moving the whole together."

The *treatment of the patient's conſtitution* next comes to be conſidered. On this head Mr. Hunter's remarks are peculiarly judicious and important.

" Bleeding (ſays he) is recommended in gun-ſhot wounds, and in ſuch a manner, as if of more ſervice in them than wounds in general; but I do not ſee this neceſſity more than in other wounds that have done the ſame miſchief, and where the ſame inflammation and other conſequences are expected.

" Bleeding is certainly to be uſed here, as in all wounds where there is a ſtrong and full habit, and where we expect conſiderable inflammation and ſymptomatic fever; but if it is ſuch a gun-ſhot wound as not to produce conſiderable effects, either local or conſtitutional, I would not bleed merely becauſe it is a gun-ſhot wound; and, from what I have ſeen, I think that inflammation, &c. does not run ſo high in theſe wounds as I ſhould have at firſt expected. I believe this is the caſe with all contuſed wounds, where death in the part is a conſequence: a contuſed wound is ſomewhat ſimilar to the effects of a cauſtic, for, while the ſeparation of the dead part is forming, the ſuppurative inflammation is retarded, and therefore not ſo violent; but this can only be ſaid of thoſe wounds which are not complicated with any other injury, except what was produced by the balls paſſing through ſoft parts; for if a bone is broke, it will inflame like any other compound fracture.

" It is often of ſervice, in the time of inflammation, to bleed in the part with *leeches*, or by punctures with a lancet; this helps to empty the veſſels of the part, to leſſen the inflammation ſooner, and, of courſe, to promote ſuppuration; but I apprehend that bleeding muſt be uſed with great caution, where inflammation and fever run very high, for to reduce the patient equal to the action at the time (which, whether an increaſed action, or an acquired one, is only temporary), will be reducing him often too much for the conſtitution to ſupport life, when this action ceaſes; for the very worſt thing that can happen, is the patient being reduced too low; we often afterwards find more difficulty in keeping up with cordials, bark, &c. than we find in lowering; and we may avail ourſelves of obſerving thoſe who have loſt conſiderable quantities of blood from the accident, which is always immediate; and we find

too, that a ſecond bleeding, by ſome other accident, although very ſmall in quantity, often deſtroys our patient very quickly; but this will, in a great meaſure, depend upon the ſeat of the injury; for, in caſes of great violence done to ſome parts of our body, bleeding anſwers better than in others, becauſe the ſymptoms of diſſolution, and diſſolution itſelf, come on ſooner from miſchief done to ſome parts, than when it is done to others.

"A man will bear bleeding better after an amputation of the arm than leg; better after a compound fracture of the arm than the leg; he will bear bleeding better after an injury done to the head, cheſt, the lungs, &c. than to either the arm or leg.

"We find that injuries done to inactive parts, ſuch as joints, do worſe, and are more ſuſceptible of irritation than thoſe in fleſhy parts of the ſame ſituation.

"It would appear upon the whole, that the decay of animal life is ſooner brought on, when the inflammation is in a part whoſe circulation is not ſo ſtrong, and where the nervous influence, or the force of the circulation, is far removed.

"Bark is greatly recommended in gun-ſhot wounds, and with good reaſon; but it is ordered indiſcriminately to all patients that have received ſuch wounds, whatever the ſymptoms or conſtitution of the patient may be. That there is no better medicine for wounds in general, not only when the *inflammation is gone off*, but in the time of inflammation, if the patient is *rather low*, and, indeed, before it comes on, experience daily ſhews. Bark is to be looked upon as a ſtrengthener, or regulator of the ſyſtem, and an antiſpaſmodic, both of which deſtroy irritation; the bark and gentle bleedings, when the pulſe begins to riſe, are the beſt treatment that I know of in inflammations that ariſe either from accidents or operations; one leſſens the volume of the blood, and the increaſed animal powers at the time, which makes the circulation more free, ſo that the heart labours leſs, and ſimple circulation goes on more freely; the other gives to the blood that which makes it leſs irritating, makes the blood-veſſels do their proper offices, and gives to the nerves their proper ſenſations, which take off the fever."

This excellent diſcrimination, as to the circumſtances under which the bark ſhould be adminiſtered, applies to various other caſes, and is highly worthy of being kept in view by every practitioner.

Some of Mr. Chriſtie's obſervations on gun-ſhot wounds, which have appeared in a periodical work, ſeem to us worthy of being annexed to the preſent ſection. He ſays, the turning courſe which a muſket-ball frequently takes on entering the body, may be accounted for by a fact well known to the artillery-men and *ſharp-ſhooters*. A cannon or muſket ball, in its paſſage through the air, hitting ſome firm reſiſting body, ſhall be ſeen to move

directly out of its ſtraight courſe, and to take one laterally, or aſcendingly. By way of illuſtration, let us ſuppoſe the head of a pin fixed on a billiard-table, and ſtruck by the moving ball centrally, its ſtraight courſe would be altered to an aſcending one, if the ball ſtrikes more or leſs laterally, ſo will its courſe be altered more or leſs oppoſitely. Thus it is with cannon and muſket ſhot; for, during the action which happened upon landing troops on the 27th of Auguſt, on the ſhore bordering the Texel, notwithſtanding the ſand hills afforded a ſort of covering for the combatants, an accident or two happened from ſhot. A ball ſtriking the head, a rib, or any other bone, and glancing along, as it frequently does, without any material injury, muſt, undoubtedly, be owing to its meeting laterally the reſiſting body, by which its force will be but partially impeded. Thus, to our great ſurpriſe, we find in gun-ſhot wounds in the extremities, that the bone remains ſound, where the ball *ſeems* to have entered directly upon it. It is therefore probable, that, in ſhots from muſkets, the bone is ſeldom fractured, unleſs the ball ſtrike *centrally*. Hard and firm bodies frequently alter the courſe of balls, ſo that death or injury is ſometimes prevented; we alſo know that claſtic ſubſtances, particularly when lubricated, poſſeſs this quality in a very eminent degree. It ſeems extremely likely, in many of thoſe lucky ſhots which have been known to penetrate the cavities of the thorax or abdomen, miſchief has been prevented by the yielding quality of the lungs or inteſtines; and thus, in ſome way, the courſe of the ball has changed, and been prevented from entering their ſubſtance, as if defended with packed wool, or hair, which are known to reſiſt powerfully the entrance of penetrating round bodies. It is not, perhaps, an improbable conjecture, that the omentum may be placed on the inteſtines, partly for this purpoſe.

Although experience may have ſhewn, that the lungs and abdominal viſcera may be penetrated by bullets, and the patient recover, the well-authenticated caſes on record are but few, and many of thoſe, at leaſt, in which the ball paſſed in from one ſide, ſo as to come out at the other, had left the viſcera unhurt; for it is to be obſerved in gun-ſhot wounds, that there muſt be always a conſiderable deſtruction of the ſurrounding parts, unavoidably ariſing from laceration; and thus the ſloughing muſt be both certain and extenſive. The velocity with which balls enter may tend, in wounds of the thorax and abdomen, to prevent miſchief, by little or no opportunity being given for the entrance of the external air, the wound cloſing like a valve, the conſequent coagulable effuſion and inflammation continuing, in a great meaſure, afterwards to ſhut up the orifice.

An officer of rank in the army, while ſerving in the West-Indies in 1796, received a muſket-ball, which lamed his hand; and, almoſt immediately afterwards, another entered a little to the

right of the left breaſt, i. e. between it and the ſternum, the ball carrying along with it a piece of ſhirt and flannel waiſtcoat; it came out almoſt oppoſite, but more outwardly, i. e. about two hand-breadths from the ſpine. The conſequence of this wound was great oppreſſion, difficulty of breathing, and occaſional bloody ſpitting. Both orifices continued long to diſcharge, and he returning to England ſoon after, apparently in a ſtate of conſumption, was induced, by the firſt medical advice in the kingdom, to adhere to a proper diet, chiefly conſiſting of milk and vegetables, and to truſt the cure to Nature. There was not any emphyſematous appearance; but, after twelve months languiſhing with diſtreſſing pain, cough, and dyſpnœa, he was reduced to a mere ſkeleton, his ſpirits fled, he refuſed nourithment, and was given up for loſt, until an extraordinary accident occurred. The ſmoke of an extraordinary number of candles brought on ſuch an intolerable fit of coughing, that a great quantity of frothy, bloody matter came up, and nearly ſuffocated him. Although the room was almoſt immediately quitted, he remained the whole night, and for ſeveral days afterwards, in the greateſt diſtreſs from the cough and dyſpnœa. After this, however, he gradually recovered, his cough left him, and with it all expectoration; he regained his appetite and ſtrength; one wound entirely healed, the other continued to diſcharge, and occaſionally to exfoliate a little bone. Twelve months after the accident it diſcharged a hard ſubſtance, which was afterwards found to be a bit of flannel waiſtcoat, encruſted with an earthy kind of matter. After this he perfectly recovered, having only a ſlight hollowneſs of voice, and occaſional pain in the ſide, on any extraordinary exertion. From the imperfection in the voice, it is probable the ſubſtance of the lungs had been penetrated. The ſame officer, in the action on the coaſt of Holland, on the 27th of Auguſt, received a muſket ſhot, which glanced along the ſquamous portion of the temporal bone, carried away a portion of the orbit, and entirely deſtroyed the left eye; notwithſtanding which he is yet healthy, active, and vigorous.

Mr. Chriſtie gives the following caſes and remarks:

" A private ſoldier, of the name of Doogen, belonging to the 27th regiment, was ſhot by a muſket-ball entering half way between the right breaſt and axilla, where the ribs ſit pretty cloſe on each other, and where the bellies of the pectoral muſcles are thickeſt. The wound became conſequently deep, and in the entrance of the ball a portion (fortunately the ſuperior one) of a rib was fractured. The man had great anxiety and difficulty of breathing, with a quick and hurried pulſe. There was no great hemorrhage from the wound. I was certain the ball entered the cheſt, but I thought it likely that the lung had eſcaped, for, during the few minutes he was with me, he ſpat up no blood. The wound was dreſſed expeditiouſly and ſecurely, and he was ſent the ſame evening to the general hoſpital, with little hopes of his ſur-

viving the accident; but, twelve days afterwards, I heard from a ſoldier who came from the hoſpital, that he was ſtill living, and, as he ſaid, doing well and likely to recover, although the ball ſtill remained in the cheſt."

This caſe ſuggeſts to Mr. Chriſtie the following query, Is it poſſible for a ball to remain harmleſs, or even compatible with life, on ſo exquiſitely ſenſible a membrane as the pleura?

If the recoveries from wounds penetrating the thorax and abdomen be few, on account of the extenſive inflammation which ſo conſtantly follows them, fewer ſtill will the recoveries be where the ſkull is entered. It is remarkable, however, how great an injury the brain will occaſionally receive, and long afterwards accommodate itſelf to the purpoſes of life, or even be followed by complete recovery. In the general action which afterwards occurred, and in which, from the nature of the ground (an immenſe ſpace of high ſands in the vicinity of Camperdown), and from the diſperſed ſituation of the troops, it happened that the wounded would be lying ſingly; and, from the impoſſibility of getting any kind of carriage on the ground, it might be ſome time until the wounded could be ſeen or collected. A private in the 27th regiment had been found on the day of action, with a wound in the head, lying alone, and apparently dying; for, as the brain had been penetrated, the ſurgeon, who accidentally found him, thought it in vain to do any thing more than, for form ſake, to apply a bit of lint, and wrap a handkerchief round the head. When ſeen the next day, he was not wholly ſenſeleſs, for he conſtantly made ſigns for water to drink, and would hardly ſuffer the canteen to be taken away from him. He was not in a coma, or ſyncope, but apparently in a ſtate between thoſe two, and frequently attempted to articulate, but could not. On waſhing his face well with cold water, he ſeemed to reliſh it, but on attempting to touch his head, there he ſhewed ſigns of morbid ſenſibility; his countenance was pale and ghaſtly, for *that* ſide of the face on which the injury was done was paralytic, the corner of the mouth falling downwards; he had, however, the uſe of all his limbs; his pulſe was feeble, depreſſed, and intermittent. Upon removing the handkerchief from his head, I found a muſket-ſhot had carried away a part of one of the parietal bones, nearly about its centre. From the wound portions of brain were puſhed outwards, ſome in detached pieces, like teaſpoonfuls. As the edges of the wound did not appear very rugged, or at all depreſſed, and eſpecially as the brain ſtill continued working out, and the poor man making ſigns in agony to have his head put up, he had a ſimple dreſſing applied, and, with no hope of his recovery, he was conveyed to the general hoſpital late in the evening.

Four days afterwards, i. e. five from the accident, he was in the ſame ſtate, raving, and the brain ſtill coming out. The confuſion

which ſucceeded from the army's retreat from Alkmaar and its neighbourhood, and the conſequent movement, or capture, of the general hoſpital, which was but a temporary one, entirely prevented Mr. Chriſtie from aſcertaining the iſſue of this caſe. It is more than probable, that the inflammation, and conſequent ſuppuration, ſhortly put an end to this patient's ſufferings; yet it is evident, from what has been related, that ſuch a fatal termination does not appear to be always brought about by mere loſs of brain.

"There is (ſays Mr. Chriſtie) one circumſtance attending gun-ſhot wounds, which I apprehend may be worthy of notice: The great velocity with which cannon and muſket balls paſs through the air muſt occaſion in their rear a momentary vacuum; may not, therefore, much miſchief be done by a portion of our body being expoſed to a ſituation where external preſſure is ſuddenly removed? In thoſe caſes which terminate fatally by the wind, as it is called, of a cannon-ball, that is, where the ball paſſes without touching, it is not likely death is brought about by a ſudden concuſſion of air on a part (as the expreſſion implies), but by a ſudden removal of a portion of air from a part eſſential to life, by which all external ſupport is removed, rupture of veſſels, or other miſchiefs follow, terminating in death; and this event, *à priori*, will be moſt likely to happen when the ball paſſes acroſs the head, cheſt, or epigaſtric region. There is another fact tending to the ſupport of this idea, which is, that a touch with a cannon or even a muſket ſhot, though hardly ſufficient to diſcolour the ſkin, will yet ſometimes knock the perſon down. It has alſo been alleged, and, poſſibly, not without reaſon, that ſlight touches from cannon or muſket ſhot are attended with more tedious or dangerous conſequences than apparently ſimilar touches from another mode of infliction; if this be really the caſe, it may probably ariſe from a vacuum ſuddenly formed over veſſels, thereby injuring or deſtroying their tone. Laſtly, a blue line, or mark, is ſometimes obſerved on men after actions, although they were not ſenſible of a ball having touched them; the extravaſation here, then, was probably owing to the external ſupport of the air being taken off for an inſtant, occaſioning rupture of veſſels, and the effuſion mentioned. But it has been alleged, and ſometimes, perhaps, alſo with reaſon, that people engaged in action, where the grim meſſengers fly thick, may be occaſionally ſo overpowered with horror, that a very ſlight blow will be ſufficient to make them tumble; or, as others will have it, and which I ſuppoſe to be moſt likely, as well as moſt frequent, the imagination on ſuch occaſions may be ſo much heated by momentary impulſe and ardour poſſeſſing the whole ſoul, as to deprive men of their acute feelings, and thus a ball may graze them without their knowledge."

We ſhall add the following remarks of this writer on the manner of dreſſing gun-ſhot wounds.

"In the application of bandages, along with compreſſes variouſly modified as it can be, the roller will be found to anſwer for any part of the body, where the wound is fleſhy. In the limbs, where there is fracture, the eighteen or twelve tailed bandage ought invariably to be uſed; and, as the application of ſome emollient poultice becomes neceſſary to ſoothe the inflammatory action, which ſoon commences after every wound, this ſort of bandage is much more handy than any other, and ought, perhaps, to be more frequently uſed than it is at preſent. Of late it has been very cuſtomary to place fractured limbs in an eaſy poſition on a pillow, covering them over merely by the fracture cradle; the cure is thus rendered comfortable; but it is plain, this cannot be adopted in moving armies, or on ſhipboard.

"For inflamed parts we meet with two kinds of poultice, oppoſite in their nature, recommended by writers, namely, the ſaturnine and emollient. The preparations of lead in poultice, as well as in waſh, for the repulſion of inflammation, are much in uſe in Scotland, chiefly from its being recommended by a deſervedly eminent and reſpected writer of that country. It requires, however, a nice care, and conſiderable experience in the proper uſe of this ſort of poultice. When the tenſion is great, the inflammation running high, and advancing rapidly, this is very apt to do miſchief; while, on the other hand, the emollient poultices always ſoothe, and alſo, by their relaxing quality, often repel, even when applied with a view of haſtening ſuppuration. It is after proper evacuations in the incipient ſtage of inflammation, and in the more indolent kinds, that I have found the applications of lead uſeful in effecting reſolution. In gun-ſhot wounds it is probable they ought never to be had recourſe to, for they will certainly tend to increaſe tenſion. The common bread and milk poultice with oil, and the linſeed poultice, are found to anſwer every purpoſe. A very convenient one, when thoſe cannot be had, as will frequently happen to the military practitioner, is made from a maceration of oatmeal in water, which takes up the glutinous and finer parts, leaving behind the groſſer particles. The infuſion is to be boiled to a proper conſiſtence, and applied with or without oil."

"With reſpect to the *extraction of balls* (continues the author), and other foreign matter, it is now, I believe, a rule not to attempt it, unleſs when readily within our reach, or placed in a ſituation that gives intolerable irritation, or where life might be endangered by their remaining. When out of reach, the ball will eaſily come out by the ſuppurative proceſs which follows; and the many inſtances on record of balls remaining for life, forming for themſelves an harmleſs bed, or working themſelves out at other parts of the

body, are numerous, and need not therefore be farther noticed here.

"In gun-ſhot wounds it rarely fails that a conſiderable degree of febrile action commences, and I know no inſtance wherein the free uſe of the lancet affords greater relief, though the inteſtines are alſo to be kept open; purging, for obvious reaſons, cannot well be fully employed. Opiates, in full doſes, muſt alſo occaſionally be had recourſe to."

We ſhall conclude what we have to offer on gun-ſhot wounds with the following important caſe, related by a gentleman of the profeſſion at Hull:

"Lieut. Wynn, of the 17th foot, was landed at Hull from the Helder, Nov. 3, with a wound in his ſide; and, by the active benevolence of Major-general Lennox, placed immediately in a comfortable lodging, under the care of Mr. Melling, who has been ſurgeon to the garriſon there upwards of forty years, with the able aſſiſtance of his very attentive partner Mr. Cranen, and under the direction of a phyſician.

"Mr. W. had been a fortnight at ſea in bad weather, was extremely emaciated, very irritable and dyſpeptic, having kept nothing upon his ſtomach whilſt on board. He complained of ſlight cough, pain in the cheſt, and the region of the left kidney, but had no dyſpnœa, and could lie on either ſide; his pulſe was quick, and he was coſtive. He related that he had been wounded on the 2d of October, and, he ſuſpected, by a grape-ſhot, for the party he commanded was within reach of a fort.

"On examination after the accident, it appeared that the ball had entered the thorax by breaking the ſecond falſe rib on the left ſide about the centre; but the ſurgeons at the Helder were not able to find the ball, nor to aſcertain how far, or in what direction, it had penetrated; they, however, obſerved, that the flame of a candle was affected by the air as it paſſed in and out of the cheſt during reſpiration.

"As ſoon as poſſible after he landed, every thing prudent was attempted in order to diſcover the ball; but it was not thought juſtifiable to comply with the earneſt wiſhes of the patient, and to lay open the cheſt for the purpoſe of making a ſearch into that cavity under the preſent circumſtances.

"The wound continued for ſome weeks to diſcharge a very large quantity of fœtid matter at every dreſſing; but, during the night of the 24th, he was ſuddenly ſeized with a violent fit of coughing, and he expectorated a very large quantity of the ſame fœtid matter as the wound had hitherto diſcharged, which taſted, he thought, of iron; in the morning the wound was perfectly dry. A conſultation was held, to determine what ought to be done; but, as there was no clue to guide the operation, it was recom-

mended to Mr. W. to wait with patience, till further information could be obtained, either from ſwelling, fixed pain, or other definite circumſtance, which ſhould point out the true ſituation of the ball.

" The Medical Board having thought proper to ſend down Dr. Hunter to be ſurgeon to the ſick and wounded Ruſſians about that time, this gentleman requeſted permiſſion to ſee the caſe; it was his opinion that the wound ſhould be enlarged, and that further ſearch ſhould be made for the ball: but the objections to ſuch an operation not being leſs than before, thoſe who had hitherto conſtantly attended him could only conſider this as a matter of experiment. Accordingly, Dr. H. himſelf undertook the operation. Having enlarged the wound between two and three inches, obliquely forwards and downwards, he examined it; but not being able to find the ball, nor any ſinus that might lead to it, he concluded that the ball had not penetrated into the thorax, but had rebounded, and that the preſent inordinate ſpitting ſhould be conſidered as phthiſis. This opinion, however, was never, for one moment, aſſented to by thoſe who had hitherto devoted their time and attention to the caſe, full of confidence that, at one time or other, an abſceſs might diſcover the ball. Mr. Cranen continued his daily attentions, and his phyſician adviſed the ſame general plan of ſupporting the patient.

" On the night of Dec. 11, the cough ſtopped as ſuddenly as it had begun; and, on taking off the dreſſings, matter poured out of the wound, from a ſmall opening near its lower edge; the probe was carefully introduced into this new aperture, and the ball was diſcovered lying within the thorax, cloſe to the broken rib, towards the ſpine, between two and three inches from the fracture, and rather below the external opening.

" Mr. W. was very impatient to have it extracted by the gentlemen preſent; but as Dr. H. was not there at the time when the ball was diſcovered, the operation was fixed for the next day. Two large inciſions were made by Dr. H. (who undertook to extract the ball), and having introduced the forceps between the ends of the broken rib, he ſucceeded in laying hold of it, but could not get it further than the opening formed by the fracture, the ball receding from the forceps into the cavity every time force was employed to draw it through. On the arrival of further aſſiſtance, a portion of the broken rib was immediately adviſed to be removed, in order to give room for the ball to paſs; this was accordingly done. Upon again bringing it forward, the opening was ſtill found leſs than the ball, and that the forceps (intended only for a leaden bullet) could not ſufficiently graſp and retain their hold of the ball, to extract it; a lever was therefore introduced behind the ball, and it was forced out by that means.

" Notwithſtanding Mr. W. was upwards of half an hour under the operation, which he bore with uncommon fortitude, he had no untoward ſymptom, except diarrhœa, no cough of any conſequence, no inflammation of the pleura; the wound healed, to all appearance, as well as if placed in any other part of the body; and when he left this place, which he did on March 1, in apparent health and high ſpirits, there remained only a very trifling opening, probably occaſioned by a ſmall exfoliation of the rib. After the operation, the flame of a candle applied to the wound was affected by reſpiration.

" The ball is of caſt-iron, and weighs three ounces and a half."

Regimen, &c.] For the firſt twelve days, in all gun-ſhot wounds, it will be proper to obſerve a cooling regimen, both in reſpect of the medicines that may be preſcribed, and the diet requiſite for the ſupport of nature. It is abſolutely neceſſary likewiſe that the body be conſtantly kept open. Unleſs, therefore, Nature does this office of herſelf, a ſtool ſhould be every day procured, either by emollient clyſters, or ſome gentle laxative taken at the mouth; and whenever there is much pain in the wounded parts, immediate recourſe muſt be had to opium, as has already been obſerved.

(No. 4.) ℞ Infuſ. ſennæ unc. vi.
Natri vitriolat. unc. j.
Mannæ unc. ſs.
Capiat cyath. vinos. pro re nata.

(No. 5.) ℞ Decoct. com. pro enem. unc. x.
Natri vitriolati
Olei olivæ ſing. unc. j.
Fiat enema.

(No. 6.) ℞ Aquæ cinnamomi unc. ij.
Sp. vitriol. æther. drach. ſs.
Tinct. opii gutt. xxx.
Vin. antimon. tart. gutt. xv.
Fiat hauſtus anodynus, hora ſomni ſumendus.

As an *external application*, whatever is of a hot ſpirituous nature is remarkably injurious on theſe occaſions, and what no wounded part can, in any degree, bear. The wound may be dreſſed with ſmall pledgets of any emollient ointment, the whole being covered with a common poultice, or, in ſome caſes, the ſolutions of lead may be uſed. The opiate ſhould now be adminiſtered; and the part affected being placed in the eaſieſt and moſt convenient poſture, the patient ſhould be laid to reſt. The formation of matter, in every contuſed wound, is an object of the firſt importance; for, till this takes place, there is often reaſon to ſuſpect that gangrene may happen. With a view to haſten ſuppuration, warm poultices, ſuch as the following, ſhould be frequently renewed;

(No. 7.) ℞ Papaveris alb. exſicc. unc. iv.
Aquæ fontis lib. vj.
Coque ad lib. ij.
(No. 8.) ℞ Fomenti papav. alb. (ut ſup.) lib. j.
Micæ panis vel
Pulv. ſem. lini q. ſ. ut fiat
Cataplaſma.

Theſe applications ſhould be continued till the tenſion and ſwelling, with which wounds of this kind are uſually attended, be removed, and till the ſore has acquired a red, healthy, granulating appearance, when it is to be treated like a common ulcer.

Gun-ſhot wounds are commonly covered from the beginning with deep ſloughs, and various remedies are recommended for removing them. Every appearance, however, of this kind with which they are attended proceeds entirely from contuſion; and, except the injury be extenſive, the ſlough is not often perceptible, or it is ſo thin as to come away along with the matter at the firſt or ſecond dreſſing. Although emollient poultices be extremely uſeful, they ought to be no longer continued than till the effects already mentioned are produced, otherwiſe they will not only relax the parts, but alſo produce too copious a diſcharge of matter, which is ſometimes attended with great danger. A too copious flow of matter may proceed from different cauſes; but, in whatever way it may have been produced, the practice to be adopted muſt be nearly the ſame. Every ſuppuration muſt have a free outlet, and the limb be laid in that poſture which will moſt readily admit of its running off. In ſuch circumſtances, nouriſhing diet and Peruvian bark, in conſiderable quantities, are highly uſeful. When the diſcharge continues copious, in ſpite of every effort to check it, detached pieces of bone, or ſome extraneous matter, are probably the cauſe. In ſuch a ſituation nothing will leſſen the quantity of matter till ſuch ſubſtances be removed. The wound ought, therefore, again to be examined, and looſe bodies removed. Pieces of the patient's clothes have been known to paſs off by ſetons, when that was practicable, after every other method had failed. Opium likewiſe is frequently uſeful in checking an exceſſive diſcharge, when it happens to be kept up by irritation.

Although no conſiderable hemorrhagy may happen at firſt in gun-ſhot wounds, yet, after the ſloughs commonly produced upon ſuch occaſions have come off, ſome conſiderable arteries may be expoſed, and then a dangerous hemorrhagy may enſue. The hemorrhagy is often preceded by a great heat in the injured parts, and with a throbbing pulſatory pain. At this period it may frequently be prevented by plentiful blood-letting, particularly local. But if the hemorrhage has fairly taken place, and from arteries of conſiderable ſize, nothing will do but the proper appli-

cation of ligatures. As the discharge in these cases would often prove dangerous before the surgeon could be found, the attendants should be furnished with a tourniquet, with directions to apply it, upon the first appearance of blood.

Till of late years the scarifying of gun-shot wounds was a practice which prevailed very universally among surgeons; and it was expected by this, that the sloughs with which wounds are sometimes covered would sooner separate, and that the cure would thereby be more readily performed. It is now, however, known, that this practice, instead of being useful, very generally does harm by increasing the inflammation: it should, therefore, be laid entirely aside. When a gun-shot wound cannot easily or safely be laid open from one end to the other, perhaps it may be proper to introduce a seton through the sinus. This, however, should not be attempted till the first or inflammatory state of the wound is over: but when a seton cannot be properly introduced, on account of the situation or direction of the wound, compression may prove equally useful here as in cases of punctured wounds.

Mortification.] If a mortification happen after a gun-shot wound, it is to be treated in the same manner as if it had arisen from any other cause, only bark is not to be promiscuously used; as, in plethoric habits, it may prove hurtful, though in debilitated relaxed habits it will be extremely useful; but even in such it should never be given but under the restrictions already laid down.

We shall conclude this subject with Mr. White's manner of giving musk and volatile alkali in mortifications, and accompany them with the sentiments of Mr. Latta, who cordially adopts the practice.

(No. 9.) ℞ Mosch.
Ammoniæ præparatæ sing. gr. x.
Conf. cynosb. q. s. M. fiat bolus.

This bolus (repeated every three hours till the gangrenous appearances began to abate) was given by Mr. White in five different cases of wounds, with the happiest effect.

"One was, after the operation of lithotomy had been performed, and where the inflammatory symptoms had run high from the first, with great pain and tension in the abdomen. The usual antiphlogistic course was persisted in till the sixth day, when an hiccup came on; the wound still continuing in an undigested state. He was then ordered a tablespoonful of a musk julep, containing about eight grains of musk, every three hours. After the seventh day, the wound began to digest, the hiccup became less frequent, and the symptoms continued favourable till the 27th day, when they returned with amazing violence. His pulse now rose to 140 in a minute, his skin dry, the tongue hard and brown, belly greatly swelled and emphysematous, the wound black and mortified, with constant hiccup, and subsultus tendinum. In such

a ſituation, no hopes of his recovery could reaſonably be entertained; nevertheleſs, with a view to mitigate, in ſome degree, the ſeverity of the ſymptoms, a bolus of ten grains of muſk, and as much ſolid volatile alkali, was ordered him. The firſt day he could take no more than four boluſſes; and no change could be perceived for the better, but that he had now a little moiſture on his ſkin. In two days, the ſymptoms becoming ſomewhat more favourable, he was prevailed upon to take a double quantity of the medicine, and the event was anſwerable to expectation. In two days his delirium went off, and, by the 35th day, all the bad ſymptoms diſappeared. The ſecond caſe was of a man, 46 years of age, who had a compound fracture of the leg; which, after much pain and tenſion, became livid on the 5th day; and, though the bark was given in conſiderable quantity, it ſoon mortified. The pulſe ſoon roſe to 140 in a minute, with other ſymptoms reſembling thoſe of the former; only that in this caſe the patient, along with his delirium, had a wildneſs in his look. On the eighth day he took the bolus of muſk with volatile alkali, and the firſt night after taking it ſlept better than he had done ſince the accident, having alſo a gentle perſpiration. The bolus was continued until he had taken two ounces and a half of muſk, and as much volatile alkali; but, from the violence of the injury, ſuch a ſloughing took place, that he did not perfectly recover his health in leſs than nine months. The third caſe was of a woman of forty years of age, who had an eryſipelas, and, on the third day of the attack, was ſeized with great drowſineſs, delirium, ſubſultus tendinum, naufea, and quick pulſe; her face, at the ſame time, being much ſwelled and livid. An aperient apozem, with nitre, was ordered to be taken occaſionally; and a bolus, with ten grains of muſk, and an equal quantity of confectio aromatica, repeated every five or ſix hours. As the naufea and delirium ſtill continued, ſhe was ordered two teaſpoonfuls of the camphor julep, with vinegar inſtead of water, frequently through the day; the bolus being alſo continued, but now made into pills. In two days ſhe appeared ſo much relieved, that the muſk was diſcontinued; but, next day, though the bark had been exhibited in conſiderable quantity, her face became more painful than before. Some relief was obtained by anodyne fomentations, but next day all the bad ſymptoms returned; her face became more livid, the delirium ran high, the ſubſultus became very frequent and troubleſome, and the pulſe roſe to more than 130 in a minute. Ten grains of muſk, with five of volatile alkali, were then ordered in a bolus, to be repeated as often as ſhe could take it. Next day ſhe was ſenſibly relieved; her ſleep had been more natural; there was ſome moiſture upon her ſkin; and the day after, ſhe was quite free from delirium and ſubſultus tendinum. All the bad ſymptoms

left her in a day or two, and she recovered perfectly in a short time. The fourth case was a compound fracture of the arm, which, in a girl of fourteen, became completely mortified in two days after the accident; the mortification extending almost as high up as the shoulder; the swelling and inflammation extending still farther, without appearing to be stopped in its progress; so that, considering the rapid advances made by the disease already, there seemed to be little hope of her surviving many hours. Twenty drops of laudanum were immediately given, and, soon after, a bolus of six grains of musk, and three of volatile alkali, to be repeated every third hour. Next morning the progress of the mortification seemed to be stopped; the musk was increased to ten grains, and the volatile alkali to six. Of this she took eight doses in twenty-four hours, not only without heating her, but with the happiest effect in abating the symptoms. In ten days, the separation of the mortified parts was far advanced; but, on omitting the musk, on account of its high price, and attempting to substitute the bark in its place, the bad symptoms returned; and the cure was not completed, until she had taken two ounces of musk, and nine drachms of the volatile salt.

"From these cases (says Mr. Latta), I think the efficacy of musk and volatile alkali is evident in wounds where mortification has already come on, or where it is threatened. We must observe, however, that, where two medicines are joined together, we cannot easily determine which of them has the merit of the cure, or whether it is to be ascribed to them both in conjunction. In the above cases, it would have been a matter of some consequence, from the mere *price* of the musk, to determine whether the volatile alkali had any considerable share in the cure; for, if it had, we may naturally suppose that it would have accomplished a cure by itself, without any musk. Indeed, from the first case, it seems natural to conclude, that the musk, by itself, was not able to accomplish a cure; for, though it had been given, as would appear from the above account, for no less than three weeks, the bad symptoms returned with such violence, as would probably have proved fatal, had not the medicine been exhibited again, with the addition of volatile alkali. The properties of this salt are known to be antiseptic and stimulant in a great degree, though a long-continued use of it will bring on a general dissolution of the blood. In cases, therefore, where there is a general tendency to putrefaction, and a great deficiency of the vital power, it is very probable that volatile alkali, especially in its concrete state, where it is joined with much fixed air, likewise a strong antiseptic, might be very serviceable. Bark is well known to be a medicine of the utmost importance and efficacy in cases of mortification, and, as such, is very commonly used in gun-shot wounds; but it would be absurd to give it, merely on account of the mortified slough which

covers the inside of these wounds; for this always takes place, and very seldom communicates itself to the adjacent parts, but separates from them as soon as a proper discharge of matter takes place. But if, after every attempt to diminish the inflammation, tension, &c. we should still be unable to prevent a gangrene, we must then apply every remedy from which we can reasonably hope for any good effect. These must always be of the tonic or stimulant kind; for there is every reason to believe that, as soon as a gangrene begins to appear in consequence of a very high inflammation, the tone of the system is reversed; and that, from being in a state of plethora, the vessels are rather in a state of collapse."

Sect. IV. *Of Poisoned Wounds.*

Poison may be introduced into wounds in various ways. The effects of the poison introduced by the stings of insects may frequently be prevented by applying immediately vinegar or ardent spirits. After inflammation has come on, the most effectual remedy is the washing the parts with cold water. The bite of a viper is not always dangerous; but as we can never judge with certainty whether the wound be poisoned or not, and as the poison of this animal acts very speedily upon the system, its bad effects ought to be prevented by every possible means. The injured part ought either to be cut out immediately, or destroyed with the actual or potential cautery, as will be observed presently.

Formerly suction was much employed, and frequently with success: it should not, however, prevent the removal of the part. After the part has been removed, we should endeavour to produce a plentiful suppuration. When the poison appears to have entered the system, the application of warm oil over the whole body has been extolled; and it has been said that advantage has been derived from the internal use of it. From some late observations, however, the efficacy of this remedy is much to be doubted. Perhaps a plentiful sweat, kept up for a considerable time, is the most certain method yet discovered. Small doses of volatile alkali frequently repeated are more to be depended on for producing this effect than any other remedy.

The *bite of a mad animal* occasions the most formidable poisoned wound known in this country. In these wounds hydrophobia indeed does not always ensue; but when it does, death is most certainly the consequence. A variety of nostrums for preventing and curing this disease have been held forth to the public; but here is not a single well-attested fact of any of them proving useful. Nothing yet known can be depended upon but the immediate removal of the injured part, either with the scalpel or the actual or potential cautery; which, together with a plentiful sup-

puration, has, in different inſtances, appeared to anſwer the purpoſe effectually; at leaſt, patients treated in this manner have eſcaped, while others, bit at the ſame time by the ſame animal, have died. But we propoſe to ſpeak more at large on this ſubject hereafter.

It is amongſt the local advantages we poſſeſs in Britain, that there are few venomous animals in it, and the poiſon of thoſe not commonly attended with fatal effects; that is to ſay, if we except the bite of mad animals, which are common to all countries, and equally dangerous in all. It is true, that this is by no means the caſe in hot climates where poiſoned wounds are productive of the moſt ſerious miſchief. Similar inconveniences alſo might be accidentally occaſioned, in this or any country, by introducing into a wound the matter of the ſmall pox, cancer, &c. We may thus poiſon the ſyſtem in ſuch a manner as to produce bad effects; but theſe laſt do not properly come under our notice in this place; the only wounds of the poiſonous kind which we have to conſider, are thoſe made by the bites of vipers, and of ſuch inſects, &c. as are natural to the ſeaſon and climate.

The hornet is, to appearance, the moſt formidable creature of the winged kind in Britain. Mr. Latta ſays it is not to be met with in Scotland; though there are neſts of them in ſome of the woods in England. The fact however is, that its ſting, though more painful than either that of the waſp or bee, is not attended with any material conſequence. Waſps ſeldom ſting, unleſs irritated by the deſtruction of their neſt, and then they attack in great numbers every one who paſſes by. It is an error to ſuppoſe that bees ſting more frequently; and that the human breath is particularly offenſive to them. It has even been repreſented as part of the ſecret of thoſe who make them ſwarm at pleaſure, without danger to themſelves, upon any part of their bodies, to keep their breath from them, as much as poſſible, leſt they ſhould thereby be provoked to ſting them. Bees are, however, the moſt harmleſs of all creatures, if not touched or interfered with, and uſe their weapons only in their defence. The ſtings of all theſe inſects are attended with a ſharp pain in the part, very quickly ſucceeded by an inflammatory ſwelling, which in no long time goes off of itſelf. It may, however, be relieved by rubbing the part, immediately after the injury, with honey, oil, vinegar, or ſpirit of wine, or even by immerſing it in cold water. There are ſeveral other inſects known to us, which do not fly, that ſeem to have ſomething poiſonous in their bite.

In this country no bite of a venomous animal is ſo formidable as that of the *viper*. According to Dr. Mead, the ſymptoms which follow the bite of a viper are, an acute pain in the place wounded, with a ſwelling, at firſt red, but afterwards livid, which by degrees ſpreads farther to the neighbouring parts; with great faintneſs, and

a quick, low, and ſometimes interrupted pulſe; great ſickneſs at ſtomach, with bilious convulſive vomitings, cold ſweats, and ſometimes pains about the navel. Frequently a ſanious liquor runs from the ſmall wound, and little puſtules are raiſed about it: the colour of the whole ſkin, in leſs than an hour, is changed yellow, as if the patient had the jaundice. Theſe ſymptoms are very frequently followed by death, eſpecially if the climate be hot, and the animal of a large ſize. This is not, however, the caſe with all kinds of ſerpents. Some, we are aſſured, kill by a fatal ſleep; others are ſaid to produce an univerſal hæmorrhagy and diſſolution of the blood; and others an unquenchable thirſt. But of all the ſpecies of ſerpents hitherto known, there is none whoſe bite is more expeditiouſly fatal than that of the rattle-ſnake. Dr. Mead tells us, that the bite of a large ſerpent of this kind killed a dog in a quarter of a minute, and to the human ſpecies it is almoſt equally fatal. Of this ſerpent it is ſaid, that the bite makes the perſon's ſkin become ſpotted all over like the ſkin of the ſerpent; and that it has ſuch a motion as if there were innumerable living ſerpents below it. But this is probably nothing more than a diſſolution of the blood, by which the ſkin becomes ſpotted as in petechial fevers, at the ſame time that the muſcles may be convulſed, as in the diſtemper called *hieranoſos*, which was formerly thought to be the effect of evil ſpirits: but it is even not improbable that obſervers have been ſomewhat aided by fancy and ſuperſtition, when they thought that they detected ſuch appearances.

It has juſtly appeared ſurpriſing to philoſophers, how ſuch an inconſiderable quantity of matter as the poiſon emitted by a viper, at the time of biting, ſhould produce ſuch violent effects. But all enquiries into this matter muſt neceſſarily be uncertain; neither can they contribute any thing towards the cure. It is certain that the poiſon produces a gangrenous diſpoſition of the part itſelf, and likewiſe ſeemingly of the reſt of the body; and that the original quantity of poiſon continues ſome time before it exerts all its power on the patient, as it is known that removing part of the poiſonous matter by ſuction will alleviate the ſymptoms.

The indications of cure here are three. (1) To remove the poiſonous matter from the body: Or, (2) If this cannot be done, to change its deſtructive nature by ſome powerful and penetrating application to the wound: And, (3) To counteract the effects of that portion already received into the ſyſtem.

The poiſonous matter can only be removed from the body by ſucking the wound either by the mouth, or by means of a cupping-glaſs; but the former is probably the more efficacious, as the ſaliva will in ſome meaſure dilute and perhaps obtund the poiſon. Mead directs the perſon who ſucks the wound to hold warm oil in his mouth, to prevent inflammation of the lips and tongue: but as bites of this kind are moſt likely to happen in the fields, and at a

diſtance from houſes, the want of oil ought by no means to retard the operation, as the delay of a few minutes might prove of the moſt fatal conſequence; and it appears from Dr. Mead's experiments, that the taking the poiſon of a viper into the mouth undiluted, is attended with no worſe conſequences than that of raiſing a ſlight inflammation. A quick exciſion of the part might alſo be adviſable as already obſerved.

The only way of anſwering the ſecond indication is, by deſtroying the poiſoned part by a red-hot iron, or the application of alkaline ſalts, which have the power of immediately altering the texture of all animal-ſubſtances to which they are applied, provided they are not covered by the ſkin; and as long as the poiſon is not totally abſorbed into the ſyſtem, theſe muſt certainly be of uſe.

To anſwer the third indication, Dr. Mead recommends a vomit of ipecacuanha, encouraged in the working with oil and warm water. The good effects of this, he ſays, are owing to the ſhake which it gives to the nerves, whereby the irregular ſpaſms into which the whole ſyſtem might be drawn are prevented. After this the patient muſt go to bed and a ſweat muſt be procured by cordial medicines; by which the remaining effects of the poiſon will be carried off.

Dr. Temple directs the uſe of *cauſtic volatile alkali* and *eau de luce*, as ſpecifics againſt the bite of the viper, in the following way: (No. 10.) ℞ Alkal. volatil. cauſt. gtts. xl. in quovis vehiculo ſumend.

Vel, (No. 11.) ℞ Sp. ammoniæ ſuccinat. (*vulgo* eau de luce) gtts. xl quovis vehiculo ſumend.

This, he obſerves, ſhould be given as ſoon as poſſible after the accident, repeating the doſe in five minutes, and alſo embrocating the parts well with it.

It has been confidently aſſerted by many, that the American Indians are poſſeſſed of ſome ſpecific remedy by which they can eaſily cure the bite of a rattle-ſnake. But Mr. Cateſby, who muſt have had many opportunities of knowing this, poſitively denies that they have any ſuch medicine. They make applications indeed, and ſometimes the patient recovers; but theſe recoveries he aſcribes to the ſtrength of nature overcoming the poiſon, more than to the remedies made uſe of. He ſays, they are very acute in their prognoſtics whether a perſon that is bit will die or not; and when they happen to receive a bite in certain parts of the body, when the teeth of the animal enter a large vein, for inſtance, they quietly reſign themſelves to their fate, without attempting any thing for their own relief. Indeed, ſo violent and quick is the operation of this poiſon, that unleſs the antidote be inſtantly applied, the perſon will die before he can get to a houſe. It would ſeem therefore eligible for thoſe who are in danger of ſuch bites, to carry along with them ſome ſtrong alkaline ley, or dry alkaline ſalt, or both, which could be inſtantly clapt on the wound, and by its diſſolving power might

deſtroy both the poiſon and the infected parts. Strong cordials alſo, ſuch as ardent ſpirits, volatile alkali, &c. might poſſibly excite the languid powers of Nature, and enable her to expel the enemy, which would otherwiſe prove too powerful. This ſeems to be ſomewhat confirmed from the account we have in the Philoſophical Tranſactions of a gentlemen bit by a rattle-ſnake, who was more relieved by a poultice of vinegar and vine-aſhes put to this wound than any thing elſe. The vine-aſhes being of an alkaline nature, muſt have ſaturated the vinegar ſo that no part of the cure could be attributed to it: on the other hand, the aſhes themſelves could not have been ſaturated by the ſmall quantity of acid neceſſary to form them into a poultice; of conſequence they muſt have operated by their alkaline quality.—Soap-ley, therefore, or very ſtrong ſalt of tartar, may reaſonably be thought to be the beſt external application, not only for the bites of vipers, but of every venomous creature; and in fact we find *dry ſalt* univerſally recommended in the bites of ſerpents. Dr. Mead recommends the fat of vipers preſently rubbed into the wound; but owns that it is not ſafe to truſt to this remedy alone.

Some years ago the volatile alkali was ſtrongly recommended by M. Sage of the French academy, as a powerful remedy againſt the bite of the viper: and, by a letter from a gentleman in Bengal to Dr. Wright, it would appear that this article, under the form of the *eau de luce*, which is very little if any thing different from the *ſpiritus ammoniæ ſuccinatus* of the London Pharmacopœia, has been employed with very great ſucceſs againſt this affection in the Eaſt Indies: but from the trials made with it by the Abbé Fontana, publiſhed in his Treatiſe on the Poiſon of the Viper, it would appear that it by no means anſwered his expectation; and the efficacy of this, as well as of the ſnake pills (the receipe for which is given in p. 118), ſtill requires to be confirmed by further experience. We ſhall here, however, introduce the opinions of Fontana and Mead, with Mr. Latta's remarks on them.

"M. Fontana (ſays the latter writer) is of opinion, that the poiſon of the viper is of a gummy nature; which, however, does not throw any light upon its mode of operation. The quantity indeed is ſo ſmall, that it moſt naturally occurs to us to be ſomething which inſtantly acts upon the vital principle contained in the blood, like a very violent ſhock of electricity. From the experiments he has made upon brute animals, he concludes, that it kills by deſtroying the irritability of the ſyſtem. But this, in fact, is ſaying nothing at all; and he might as well have told us that it kills by bringing on death. The deſideratum is, what change is induced in the body by the bite of a viper? and by what means can this change be counteracted?—M. Fontana informs us afterwards, that it ſeems to induce a tendency to putrefaction throughout the whole body. Now, this tendency to putrefaction, we know,

proceeds from a deficiency of the vital power; and hence, as M. Fontana informs us, thoſe who have been bit complain firſt of an univerſal weakneſs; their muſcles refuſe their office, they become dull and heavy, have no longer the free uſe of body, or mind, and fall inſenſibly into a kind of lethargy. When ſmall animals die of the bite of a viper, their fleſh becomes, at once, ſo tender, that the limbs may eaſily be pulled off from the body; and in twenty-four hours their bodies become quite putrid.

"The cures recommended for the bites of vipers are, according to M. Fontana, not only of very different, but even oppoſite qualities. 'In no country (ſays he) through which I paſſed could I ever find any two people or perſons bit by the viper, either in the mountains or valleys, that uſed the ſame remedies. Some uſed theriaca alone, either externally or internally applied; others common oil; a third ſet uſed ſtimulants, ſuch as the ſtrongeſt ſpirituous liquors; whilſt others on the contrary, tried every different kind of ſedative. In ſhort, there is hardly any active kind of medicine that has not been tried as a cure in this diſeaſe; while, at the ſame time, it is certain, that, under all the varieties of application, none of them died.' Hence our author concludes, that none of the remedies made uſe of had any effect in curing the diſeaſe; which, indeed, is by no means improbable, conſidering that many of them muſt have acted in a manner directly contrary. But this only proves that the bites of the vipers of Italy are not mortal. In a hotter climate, they certainly will be attended with more dangerous conſequences. Hence, in the iſland of Malta, even in the winter time, when the viper came out of the fire, no doubt enraged to the utmoſt degree, and faſtened on the hand of the apoſtle Paul, the people expected that 'he ſhould have ſwoln, or fallen down dead ſuddenly;' whence we may ſee, that, in Malta, which is indeed very hot, the ſymptoms attending the bite of theſe creatures were then extremely violent;' and it was thought miraculous to eſcape death in conſequence of it. And we have the moſt undoubted authority for believing, that in America, as well as the Eaſt Indies, the bite of ſome ſerpents is attended with very ſpeedy death. With regard to the cure of the bite of vipers, in ſuch animals as were liable to be killed by it, our author ſays, from his own experience, that neither ſcarifications, nor even the exciſion of the part, are beneficial, but, on the contrary, hurtful. We may, indeed, readily conclude that ſcarifications muſt be hurtful, becauſe they do not tend to take away the poiſon, but rather to allow it more free acceſs to the blood; but, we cannot ſo well ſay this of exciſion, if properly performed. Perhaps the poiſon may be injected to ſome depth, ſo that the place where it is lodged may not be cut away; and, if this be the caſe, it muſt do harm for the ſame reaſon that ſcarifications do. In like manner, he found oil, volatile alkali, theriaca, &c. either uſeleſs, or abſolutely hurtful, particularly the volatile alkali. The only thing

which he found of any avail, was the tying of a ligature round the bitten limb, to ſtop the progreſs of the blood towards the heart. This certainly muſt prevent, in ſome meaſure, the diſeaſe from becoming general throughout the ſyſtem, and therefore ought always to be uſed. It likewiſe promotes a flux of blood from the wounded part, by which the poiſon will be partly diſcharged; and if to this precaution we add that recommended by Dr. Mead, of ſucking the wound, it is poſſible that death might be prevented, even after a bite of the moſt deadly ſerpent. This practice, of ſucking the wound, has been recommended very early; and, indeed, if it can be done with ſafety to the perſon who ſucks, it has every appearance of ſucceſs. Dr. Mead is at ſome pains to ſhow that it may be done with ſafety; but I am altogether at a loſs to account for the difference between him and M. Fontana, concerning the taſte of the poiſon; the former affirming, from his own experience, and that of ſeveral others, that it had a violent hot and fiery taſte, as if the tongue was ſtruck through with ſomething burning or ſcalding; while M. Fontana as confidently affirms that it has no taſte, nor raiſes any inflammation on the tongue. Dr. Mead affirms, that, in a gentleman already mentioned, an inflammation was raiſed on the tongue which did not go off in two days.

"In treating this diſeaſe, Dr. Mead ſeems to lay conſiderable ſtreſs upon emetics; and, indeed, in all caſes where the bite ſeems to be diffuſed through the body, this remedy has a chance of being uſeful, by relieving the extreme ſickneſs and naufea with which the patient is affected; for nothing produces greater ſickneſs than a putrefcent bile on the ſtomach.

"It is evident, that, in caſes of this kind, external applications can avail but little. Oil has been recommended; but the trials made by Dr. Mead ſhowed it to be inſufficient. He ſeems to have ſome confidence in the fat of the viper itſelf; but it is evident that the ſucceſs of this, or any other remedy of the kind, muſt depend entirely upon an accidental circumſtance. It is not impoſſible, that, if any oily matter could get at the poiſon, it might ſo blunt or ſoften it, that its deadly effects would be prevented; but it is eaſy to ſee, that, by reaſon of the narrowneſs and depth of the wound, we have but a ſmall chance of mixing it with the poiſon, after it has once been injected. Nevertheleſs, this has perhaps been ſometimes done; and thus, both olive oil and viper's fat have gained their reputation, though, in by far the greateſt number of inſtances, they could be of no efficacy.

"To complete the cure, Dr. Mead recommends the uſe of warm cordials, among which he mentions volatile ſal-ammoniac, to produce a ſweat, and ſeems indeed to inſiſt upon theſe medicines as neceſſary for the recovery of the patient. Indeed, from what we can conclude concerning the nature of this diſeaſe, it is probable, that the cure can only be accompliſhed by means of the very higheſt

cordials. An univerſal inflammation ſeems firſt to be excited; but this runs through the inflammatory ſtage ſo faſt, that we have no time to apply the antiphlogiſtic regimen, before the inflamed parts, or rather all the parts of the body, acquire a gangrenous tendency. The bite of a very poiſonous ſerpent, therefore, induces a diſeaſe ſomewhat ſimilar to a very ſevere plague, by which, we are told, that there is ſometimes very little interval, between apparently perfect health, and ſuch a gangrenous ſtate of the blood and juices, as produced purple ſpots, the immediate forerunners of death. In either of theſe caſes, it is difficult to ſay, whether any thing could be done or not; nevertheleſs, in the bites of ſerpents, we are ſure that the wound is the original ſource of the diſeaſe; and therefore, the precaution of cutting off all communication betwixt it and the heart, by means of a ligature, ought by no means to be omitted, even though it ſhould be ſome time before the ſurgeon is called; for, if the poiſon has a gummy nature, it will be ſome time before it diſſolves entirely in the blood; and, until it does ſo, it cannot produce its full effect. Beſides this, it would ſeem proper to apply the ſtrongeſt antiſeptic and cordial medicines we have; and it is probable that we have none better than bark and wine. Vegetable acids, taken in great quantities, are ſaid to be uſeful in the plague. It is certain, from ſome late experiments, that they ſweeten the bile, and deprive it of its acrimony; ſo that they might have ſome chance of doing good, in removing the conſequences of thoſe bites, where the bile ſeems to be ſo much affected.

"In this country, the bites of ſerpents are not mortal, either to the human ſpecies, or to cattle. The latter are frequently bitten, when wandering in the hills; and the conſequence is a permanent tumor on the part. I have not heard of any remedy uſed in this caſe; except the ridiculous one of waſhing the part with an adder's ſkin. It is not impoſſible, however, that the application of cold water may be of ſome uſe, though the *ſkin* with which it is applied can be of none."

On the effects of the bites of venomous animals in *hot* climates, it is neceſſary to treat more at large, ſince many of theſe are either certainly fatal, or very difficult to remedy.

In France, Italy, and all the ſouth of Europe, in Africa, and both the Indies, the ſcorpion is a very formidable creature. It has eight feet, beſides two frontal claws; the eyes are eight in number, three on each ſide of the thorax, and two on the back. It has two claw-ſhaped palpi, a long jointed tail, with a pointed weapon at the extremity; it has likewiſe two combs, ſituated betwixt the breaſt and abdomen. There are ſix ſpecies, all natives of ſouthern climates.

In ſeveral parts of the continent of Europe it is but too well known, though it ſeldom grows above four inches long; but in the warm tropical climates it is ſeen a foot in length, and in every

reſpect as large as a lobſter, which it ſomewhat reſembles in ſhape. There have been enumerated nine different kinds of this dangerous inſect, including ſpecies and varieties, chiefly diſtinguiſhed by their colour; there being ſcorpions, yellow, brown, and aſh-coloured; others that are the colour of ruſty iron, green, pale yellow, black, claret colour, white, and grey. There are four principal parts diſtinguiſhable in this animal; the head, the breaſt, the belly, and the tail. The ſcorpion's head ſeems, as it were, jointed to the breaſt; in the middle of which are ſeen two eyes; and a little more forward two eyes more, placed in the fore part of the head: thoſe eyes are ſo ſmall, that they are ſcarcely perceivable; and it is probable the animal has but little occaſion for ſeeing. The mouth is furniſhed with two jaws: the undermoſt is divided into two, and the parts notched into each other, which ſerves the animal as teeth, and with which it breaks its food, and thruſts it into its mouth: theſe the ſcorpion can at pleaſure pull back into its mouth, ſo that no part of them can be ſeen. On each ſide of the head are two arms, each compoſed of four joints; the laſt of which is large with ſtrong muſcles, and made in the manner of a lobſter's claw. Below the breaſt are eight articulated legs, each divided into ſix joints; the two hindmoſt of which are each provided with two crooked claws, and here and there covered with hair. The belly is divided into ſeven little rings; from the loweſt of which is continued a tail, compoſed of ſix joints, which are briſtly, and formed like little globes, the laſt being armed with a crooked ſting. This is that fatal inſtrument which renders this inſect ſo formidable: it is long, pointed, hard and hollow; it is pierced near the baſe by two ſmall holes, through which, when the animal ſtings, it ejects a drop of poiſon, which is white, cauſtic, and fatal. The reſervoir in which this poiſon is kept, is in a ſmall bladder near the tail, into which the venom is diſtilled by a peculiar apparatus. If this bladder be greatly preſſed, the venom will be ſeen iſſuing out through the two holes above mentioned; ſo that it appears, that when the animal ſtings, the bladder is preſſed, and the venom iſſues through the two apertures into the wound.

We have here given the common account of the ſting of theſe noxious animals; but though we cannot pretend to determine between them, we ſhall lay before our readers the following obſervations from a treatiſe on *Tropical Diſeaſes*, &c. by Dr. Moſely of Chelſea hoſpital. "Galen juſtly obſerves, that a perſon who had not witneſſed the fact, would not ſuppoſe that ſo ſmall an injury as the ſting of a ſcorpion, or the bite of a poiſonous ſpider, could produce the violent effects which they do in the whole body. He ſays, the aculeus, or ſting, of a ſcorpion ends in the minuteſt point; and has no perforation through which any poiſon can paſs into the wound. Yet, he ſays, we muſt ſuppoſe the venom to be ſome ſpiritual ſubſtance, or moiſture, in which a great power is concentrated in a ſmall compaſs. Before I had an opportunity (ſays Dr.

Moſeley) of examining this ſubject, my reſpect for the opinion of Galen made me doubt the accuracy of Leuwenhoek, Redi, Mead, and others, who aſſert that there is an aperture near the cuſpis of a ſcorpion's ſting; and that through this aperture a liquid poiſon is injected when a wound is inflicted. Repeated experiments, with the beſt glaſſes, have never enabled me to diſcover any foramen, or opening whatever."

The following cure may alſo be worth the reader's notice. "Mrs. Pidgeley, at Kingſton in Jamaica, in January, 1781, was ſtung by a ſcorpion in the foot, above the little toe. The part became inſtantly red and painful; and ſoon after livid. The pain increaſed to great ſeverity. Some rum was applied to the wound, on which the pain immediately left the foot, and paſſed up to the groin, with great agony. The pain ſtill paſſed upwards, and diffuſed itſelf about the pit of the ſtomach, neck, and throat, attended with tremors, cold ſweats, and languors. As the pain paſſed the abdomen, it occaſioned a violent purging and fainting, which ceaſed on its advancing higher." The author was called to her, and gave her the following medicines, a few doſes of which removed every ſymptom. She had been extremely ill for thirty-ſix hours.

(No. 12.) ℞ Sal. Succin. ℥ij.
Camphor. gr. xij.
Cinnabar. Antimon. gr. x.
Confect. Card. q. ſ. fiant boli ſex.

One of theſe was taken every hour, with four ſpoonfuls of the following mixture:

(No. 13.) ℞ Aq. Menthæ ʒ vij.
Elix. Paregoric. ʒ ij.
Syr. Croci ʒ ſſ. Miſce fiat Mixtura.

There are few animals more formidable, or more truly miſchievous, than the ſcorpion. As it takes refuge in a ſmall place, and is generally found ſheltering in houſes, it muſt frequently ſting thoſe among whom it reſides. In ſome of the towns of Italy, and in France, in the province of Languedoc, it is one of the greateſt peſts that torment mankind: but its malignity in Europe is trifling, when compared to what the natives of Africa and the Eaſt are known to experience. In Batavia, where they grow twelve inches long, there is no removing any piece of furniture without the utmoſt danger of being ſtung by them. Boſman aſſures us, that along the Gold Coaſt they are often found larger than a lobſter; and that their ſting is inevitably fatal. In Europe, however, they are by no means ſo large, ſo venomous, or ſo numerous. The general ſize of this animal does not exceed two or three inches; and its ſting is very ſeldom found to be fatal. Maupertuis, who made ſeveral experiments on the ſcorpion of Languedoc, found it by no means ſo invariably dangerous as had till then been repreſented. He provoked one of them to ſting a dog, in three places of the belly where the animal was without hair. In about an hour

after the poor animal ſeemed greatly ſwollen, and became very ſick: he then caſt up whatever he had in his bowels; and for about three hours continued vomiting a whitiſh liquid. The belly was always greatly ſwollen when the animal began to vomit; but this operation always ſeemed to abate the ſwelling; which alternately ſwelled, and was thus emptied, for three hours ſucceſſively. The animal after this fell into convulſions, bit the ground, dragged himſelf along upon his four feet, and at laſt died, five hours after being bitten. He was not partially ſwollen round the place which was bitten, as is uſual after the ſting of a waſp or a bee; but his whole body was inflated, and there only appeared a red ſpot on the places where he had been ſtung.

Some days after, however, the ſame experiment was tried upon another dog, and even with more aggravated cruelty: yet the dog ſeemed no way affected by the wounds: but, howling a little when he received them, continued alert and well after them; and ſoon after was ſet at liberty, without ſhowing the ſmalleſt ſymptoms of pain. So far was this poor creature from being terrified at the experiment, that he left his own maſter's houſe, to come to that of the philoſopher, where he had received more plentiful entertainment. The ſame experiment was tried by freſh ſcorpions upon ſeven other dogs, and upon three hens; but not the ſmalleſt deadly ſymptom was ſeen to enſue. From hence it appears, that many circumſtances, which are utterly unknown, muſt contribute to give efficacy to the ſcorpion's venom. Whether its food, long faſting, the ſeaſon, the nature of the veſſels it wounds, or its ſtate of maturity, contribute to or retard its malignity, is yet to be aſcertained by ſucceeding experiment. In the trials made by our philoſopher, he employed ſcorpions of both ſexes, newly caught, and ſeemingly vigorous and active. The ſucceſs of this experiment may ſerve to ſhow, that many of thoſe boaſted antidotes which are given for the cure of the ſcorpion's ſting, owe their ſucceſs rather to accident than their own efficacy. They only happened to cure when their ſting was no way dangerous; but in caſes of actual malignity they might probably be utterly unſerviceable.

The ſcorpion of the tropical climates being much larger than thoſe of the former, is probably much more venomous. Helbigius, however, who reſided for many years in the Eaſt, aſſures us, that he was often ſtung by the ſcorpion, and never received any material injury from the wound; a painful tumor generally enſued; but he always cured it by rubbing the part with a piece of iron or ſtone, as he had ſeen the Indians practiſe before him, until the fleſh became inſenſible. Seba, Moore, and Boſman, however, give a very different account of the ſcorpion's malignity; and aſſert, that, unleſs ſpeedily relieved, the wound becomes fatal.

It is certain, that no animal in the creation ſeems endued with ſuch an iraſcible nature. They have often been ſeen, when taken and put into a place of ſecurity, to exert all their rage againſt the

ſides of the glaſs-veſſel that contained them. They will attempt to ſting a ſtick when put near them; and attack a mouſe or a frog, while theſe animals are far from offering any injury. Maupertuis put three ſcorpions and a mouſe into the ſame veſſel together, and they ſoon ſtung the little animal in different places. The mouſe, thus aſſaulted, ſtood for ſome time upon the defenſive, and at laſt killed them all, one after another. He tried this experiment, in order to ſee whether the mouſe, after it had killed, would eat the ſcorpions; but the little quadruped ſeemed ſatisfied with the victory, and even ſurvived the ſeverity of the wounds it had received. Wolkamer tried the courage of the ſcorpion againſt the large ſpider, and incloſed ſeveral of both kinds in glaſs veſſels for that purpoſe. The ſucceſs of this combat was very remarkable. The ſpider at firſt uſed all its efforts to entangle the ſcorpion in its web, which it immediately began ſpinning; but the ſcorpion reſcued itſelf from the danger, by ſtinging its adverſary to death; it ſoon after cut off, with its claws, all the legs of the ſpider, and then ſucked all the internal parts at its leiſure.—If the ſcorpion's ſkin had not been ſo hard, Wolkamer is of opinion that the ſpider would have obtained the victory; for he had often ſeen one of theſe ſpiders deſtroy a toad.

The fierce ſpirit of this animal is equally dangerous to its own ſpecies; for ſcorpions are the crueleſt enemies to each other. Maupertuis put about 100 of them together in the ſame glaſs; and they ſcarce came into contact when they began to exert all their rage in mutual deſtruction: there was nothing to be ſeen but one univerſal carnage, without any diſtinction of age or ſex, ſo that in a few days there remained only 14, which had killed and devoured all the reſt.

But their unnatural malignity is ſtill more apparent in their cruelty to their offſpring. He incloſed a female ſcorpion, big with young, in a glaſs veſſel, and ſhe was ſeen to devour them as faſt as they were excluded: there was but one only of the number that eſcaped the general deſtruction, by taking refuge on the back of its parent; and this ſoon after revenged the cauſe of its brethren, by killing the old one in its turn.

Such is the terrible and unrelenting nature of this inſect, which neither the bonds of ſociety nor of nature can reclaim; it is even aſſerted, that when driven to an extremity, the ſcorpion will often deſtroy itſelf. The following experiment was ineffectually tried by Maupertuis: "But," ſays Goldſmith, "I am ſo well aſſured of it by many eye-witneſſes, who have ſeen it both in Italy and America, that I have no doubt remaining of its veracity. A ſcorpion, newly caught, is placed in the midſt of a circle of burning charcoal, and thus an egreſs prevented on every ſide; the ſcorpion, as I am aſſured, runs for about a minute round the circle, in hopes of eſcaping: but finding that impoſſible, it ſtings itſelf on the back

of the head; and in this manner the undaunted ſuicide inſtantly expires."

It is happy for mankind that theſe animals are thus deſtructive to each other; ſince otherwiſe they would multiply in ſo great a degree as to render ſome countries uninhabitable. The male and female of this inſect are very eaſily diſtinguiſhable: the male being ſmaller and leſs hairy. The female brings forth her young alive, and perfect in their kind. Redi having bought a quantity of ſcorpions, ſelected the females, which, by their ſize and roughneſs, were eaſily diſtinguiſhable from the reſt; and putting them in ſeparate glaſs veſſels, he kept them for ſome days without food. In about five days one of them brought forth 38 young ones, well ſhaped, and of a milk white colour, which changed every day more and more into a dark ruſty hue. Another female, in a different veſſel, brought forth 27 of the ſame colour; and the day following the young ones ſeemed all fixed to the back and belly of the female. For near a fortnight all theſe continued alive and well: but afterwards ſome of them died daily; until, in about a month, they all died except two.

Were it worth the trouble, theſe animals might be kept living as long as curioſity ſhould think proper. Their chief food is worms and inſects; and upon a proper ſupply of theſe, their lives might be lengthened to their natural extent. How long that may be, we are not told; but if we may argue from analogy, it cannot be leſs than ſeven or eight years; and perhaps, in the larger kind, double that duration. As they have ſomewhat the form of the lobſter, ſo they reſemble that animal in caſting their ſhell, or more properly their ſkin; ſince it is ſofter by far than the covering of the lobſter, and ſet with hairs, which grow from it in great abundance, particularly at the joinings. The young lie in the womb of the parent, each covered up in its own membrane, to the number of 40 or 50, and united to each other by an oblong thread, ſo as to exhibit altogether the form of a chaplet.

Such is the manner in which the common ſcorpion produces its young: but there is a ſcorpion of America produced from the egg, in the manner of the ſpider. The eggs are no longer than pin's points; and they are depoſited in a web, which they ſpin from their bodies, and carry about with them till they are hatched. As ſoon as the young ones are excluded from the ſhell, they get upon the back of the parent, who turns her tail over them, and defends them with her ſting. It ſeems probable, therefore, that captivity produces that unnatural diſpoſition in the ſcorpion which induces it to deſtroy its young: ſince, at liberty, it is found to protect them with ſuch unceaſing aſſiduity.

The various modes of preventing the fatal conſequences of the bite of this and other noxious animals, are thus ſtated by Dr. Moſeley.

" The bites and ſtings of all venomous animals are cured by the ſame local means; which are very ſimple, if they were always at hand. The injured part muſt be inſtantly deſtroyed, or be cut out. Deſtroying it is the moſt ſafe, and equally certain: and the beſt application for that purpoſe, is the *lapis infernalis*, or the butter of antimony.—Theſe are preferable to an hot iron, which the ancients uſed, becauſe an hot iron forms a cruſt, which acts as a defence to the under parts, inſtead of deſtroying them. The *lapis infernalis* is much better than any other cauſtic; as it melts and penetrates during its application. The bitten part muſt be deſtroyed to the bottom, and where there is any doubt that the bottom of the wound is not ſufficiently expoſed, butter of antimony ſhould be introduced into it on the following day, as deep as poſſible; and inciſions ſhould be made to lay every part open to the action of theſe applications. Beſides deſtroying, burning, or cutting out the part, inciſions ſhould be made round the wound, to prevent the communication of the virus. The wound is to be dreſſed for ſome time with poultices, to aſſauge the inflammation cauſed by the cauſtics; and afterwards with acrid dreſſings, and hot digeſtives, to drain the injured parts.

" Where the above-mentioned cauſtics cannot be procured, corroſive ſublimate, oil of vitriol, aqua fortis, ſpirit of ſalt, common cauſtic, or a plaſter made of quick-lime and ſoap, may be applied to the wound. Gunpowder laid on the part, and fired, has been uſed with ſucceſs. When a perſon is bitten, remote from any aſſiſtance, he ſhould make a tight ligature above the part, until proper application can be made. The ſpaniſh writers ſay, that the *habilla de Carthagena*, or Carthagena bean, is a ſpecific for poiſonous bites, taken inwardly.

" Ulloa ſays, 'it is one of the moſt effectual antidotes known in that country (Carthagena) againſt the bites of vipers and ſerpents: for a little of it being eaten immediately after the bite, it preſently ſtops the effects of the poiſon; and accordingly all who frequent the woods, either for felling trees or hunting, never fail to eat a little of this habilla faſting, and repair to their work without any apprehenſion.

" 'The natives tell you, that this habilla being hot in the higheſt degree, much of it cannot be eaten; that the common doſe of it is leſs than the fourth part of a kernel; and that no hot liquor, as wine, brandy, &c. muſt be drunk immediately after taking it.' Book I. ch. 6.

" The Carthagena bean, or habilla, is found in great abundance in the Weſt-Indian iſlands, where it is generally known by the name of antidote, or cocoon, or antidote cocoon. In ſmall doſes it is ſtomachic and diaphoretic; and in large doſes emetic and purgative. In ſeveral diſorders it is a powerful remedy; but its virtues are not ſufficiently known, except among the Indians and

negroes, who chiefly use an infusion, or tincture, of it made in rum. This is externally, as well as internally, used for many complaints.

"I have been informed by some intelligent Indians, that any of the red peppers, such as bird pepper, or bell pepper, or what is called cayenne pepper, powdered and taken in a glass of rum as much as the stomach can possibly bear, so as to cause, and keep up for some time great heat and inflammation in the body, and a vigorous circulation, will stop the progress of the poison of serpents, even after its effects are visible; and that the bitten part only afterwards mortifies, and separates, and that the patient, with bark, wine, and cordials, soon recovers.

"This fiery practice is certainly agreeable to that of the ancients, and probably the only internal treatment that can have any good effect; as in these cases the powers of life, and the action of the heart, are suddenly enfeebled, and the pulse in strength and frequency observes almost a regular declension, from the time of the bite, until it entirely ceases in death.

"This confirms the remark of Celsus, that venomous bites kill by extinguishing the vital heat. But there is no relying with security on any thing, without the *external treatment*.

"The Indians in Popayan, when any person has been poisoned by the *coya*, or *coyba* (a deadly venomous insect, shaped like a spider, but less than a bug), burn the part: and if the body begins to swell, they singe it all over with the flame of straw, or dry grass: —this process generally succeeds."

Galen asserts, that the slightest scratch in the skin is sufficient to communicate the poison of animal venom; and also infers, that this venom operates by affecting the nerves; extending the mischief by means of their communication, from the injured part, to the whole system. He supposes, that though the sting of a scorpion may pierce through the skin, the bite of a poisonous spider does not: that penetrates no deeper than the superficies of the skin; and yet the whole body is soon violently affected by it. The cause of which, he remarks, is, that the skin is a continued covering over the whole body, and full of nerves; from whence poisonous infection may be swiftly distributed to the origin of the nerves, or to some vital part, and become fatal. Yet Galen, in all cases of venomous stings and bites, advises a ligature to be made, in the first instance, above the injured part; the good effects of which he had experienced. But the use of ligatures, seem more applicable to the doctrine of lymphatic absorption, which was not known in Galen's time.

"But vascular absorption (says Dr. Moseley) is by no means adequate to the phænomena, which arise from externally applied venom, or infection. Nor has it ever been ascertained, notwithstanding some pertinacious opinions, whether the solids or the

fluids are the conductors of that univerſal affection which deranges the whole ſyſtem, from the above cauſes.

" The redneſs of the ſkin, and pain, which may be traced in the lymphatics and glands, leading from a part where infection has been inſerted, is no concluſion. A puncture from the point of a needle often produces ſimilar conſequences.

" Whence comes it, that the ſmalleſt portion imaginable of the poiſon of ſome ſerpents, ſo inſtantaneouſly changes the ſtate of the ſolids and fluids, and ſo breaks down their union, that life is extinguiſhed, with electric rapidity; and that the poiſon of a mad dog ſhould be four, or ſix weeks before its effects appear; and ſometimes three, ſix, nine, or twelve months?

" The movement of the lymphatic fluid is too ſlow for one of theſe operations, and too quick for the other."

After invalidating Dr. Mead's theory of infection, which ſuppoſes that there exiſts a fluid in the nerves, which conveys poiſons into the ſyſtem, and on which alſo he ſuppoſes them to excite their dreadful effects, the author proceeds to ſtate the opinions of the Abbé Fontana.

" Fontana (ſays he) aſſerts, that the blood is the ſeat of the action of poiſons; and that when they are introduced into it, they bring on death, by deſtroying the irritability of the muſcular fibres.

" He founds his opinion on experiments, made by injecting ſome of the poiſon of a ſerpent into the jugular vein of animals; the effects of which were immediate death.

" He aſſerts alſo, that this poiſon is entirely innocent to the nerves. This opinion he ſupports by having laid bare the ſciatic nerve, and after wounding it, he applied ſome of the poiſon to it. The ſymptoms and phænomena that followed, he ſays, differed in nothing from thoſe which appear from a ſimple wound of the nerve with the point of any inſtrument; death being the conſequence in both caſes alike.

" He confeſſes, that the ſame poiſon as was injected into the vein, made not the leaſt change in the blood out of the body, though mixed with it the inſtant it came from the orifice, and received into a veſſel warmed to the heat of the blood."

Dr. Moſely very properly aſks in this place, " how it happens, that hæmiplegia, and other degrees of palſy, are ſometimes cauſed by the bites of vipers, if the nerves have no concern in the operation of the poiſon?

" Whence ariſe palpitations, tremors, vertigo, cold ſweats, incontinence of urine, vomiting, and purging, from the ſting of a ſcorpion, or the bite of a ſpider?

" How comes it, that a polypus, having no teeth, kills a water worm, an animal tenacious of life, by only touching it with his mouth or lips?

"Beſides, olive oil, and a thouſand other equally innocent things, injected into the jugular veins cauſe ſpeedy death."

Theſe objections he thinks warrant the concluſion that Fontana's idea, "that the lunar cauſtic is the *true ſpecifical remedy againſt the dreadful poiſon of the viper*," is not to be regarded, ſince it is not an "antidote to the venom," as he affirms, as *acting by any ſpecific virtue*. "But, like the *lapis infernalis*, or any other powerful cautery, it deſtroys all organization within the ſphere of its action; and by rendering the part affected, no longer a living part, creates inſenſibility to the operation of the poiſon, and an incapacity of communicating it."

The eminent and reſpectable author whom we quote ſpeaks of other venomous reptiles, the noxious effects produced by their bites, and the means of remedying or preventing them, in the following terms:

"There is a race of viſitors alſo which gives ſome uneaſineſs to new-comers (to the Weſt Indies); theſe are gnats, or, as they are called, muſquitoes. They are moſt troubleſome towards night, in warm wet weather, and near woody, damp, or marſhy ſituations. Italy is infeſted in the ſame manner in the ſummer-time, wherever there are rivers and ſtagnant waters; which I have experienced in many places, and can juſtify Horace's complaint in his marſhy journey from Rome to Fundi, in his way to Brunduſium.

"Though muſquitoes are a great vexation in all the iſlands, yet they are worſe on the continent. It is ſaid at Mexico, and many other places, that they ſometimes kill people with their bites. Sir Henry Morgan thought, from the amazing quantity which he ſaw at the lake Maracayba, that it was a cloud before him.

"Their bites raiſe little lumps, or ſwellings, in the ſkin, which cauſe an uncommon degree of itching; theſe are ſcratched ſometimes into painful acrid ulcers, particularly in the legs. A bite, if not ſcratched, or irritated, though extremely diſagreeable, will not long continue troubleſome. Some people apply oil, vinegar, lime-juice, or camphorated ſpirits, to the part, to allay the itching and tingling. In the inland and woody ſituations, even thoſe who have been long reſident in theſe countries, find it convenient to wear a ſort of looſe linen buſkins, to guard their legs in an evening; and it is an univerſal cuſtom to have a gauze curtain, or net, to ſurround the bed, to keep them away by night; otherwiſe, in ſome places, it would be impoſſible to ſleep.

"Fire and ſmoke drive them away; and this is another practice uſed by people who reſide in the woods, and interior parts of the iſlands. On the continent, near woods and ſtagnant waters, the Indians bury themſelves in ſand, in an evening, having no other means to avoid their perſecution.

"Another tropical inſect frequently attacks the feet and toes of new-comers, and ſurpriſes them with an unuſual ſenſation of

itching; the reſidents are equally ſubject to the plague of theſe almoſt inviſible vermin, and are ſometimes lamed by them. Theſe are *Chigoes*, a kind of little fleas; they chiefly keep in duſty, dirty places, and are bred on hearths, and in chimney-corners, among the aſhes: they are about the ſize of a cheeſe-mite. They lance the ſkin imperceptibly in the ſoles of the feet, or about the toe-nails, and inſinuate themſelves, where they depoſit their eggs, including their eggs and themſelves in a little round veſicle, which increaſes to the ſize of a ſmall pea ſometimes, before it is noticed. It then acquires a blueiſh appearance, from the colour of the Chigo itſelf, which is in the midſt of an innumerable quantity of *animalcula*, each of which is capable of creating a new diſturbance, if, in taking out the bag, it be broken, and any remain behind in the fleſh. Some people have had great inflammations from them, and ſome have had their toes mortified. The negroes often let them collect and remain in their feet, until their toes rot off.

"The common method of taking out the bag, is, with the point of a needle, without piercing it, by ſeparating it from the ſkin quite round, and drawing it out; then filling up the hole, and rubbing the part with tobacco-aſhes. Ligon ſays, he had ten chigoes taken out of his feet in a morning, while he was at Barbadoes (which was from 1647 to 1650), by the moſt unfortunate Indian woman Yarico.

"There is alſo abundance of ſcorpions, tarantulas, centipedes, and ſpiders, whoſe venomous ſtings and bites are very painful, but rarely attended with danger. The tarantulas have their habitations in looſe rocky places, and in the mountains; and thoſe other inſects are generally found in old buildings, among rotten wood, and in unfrequented places: ſometimes they creep forth into beds, and among people's clothes, particularly ſcorpions, and are not detected until they are diſcovered by their ſting. Rum, or oil, applied, generally abates the anguiſh of the wound: but if a fever, with convulſive twitchings, enſue, which in bad habits of body, or when the wound is in a part of great ſenſibility, will ſometimes happen, the wound ſhould be immediately ſlightly burnt with *Lapis Infernalis*, or any cauſtic, and afterwards poulticed, and the patient ſhould take ſome warm diluting diaphoretic, with an opiate.

"Of the various venomous ſerpents in Spaniſh America (continues the author), we have but an imperfect account from the Spaniards. They reckon the following the worſt, and moſt common.

"The coroles, or coral ſnakes, which are about four or five feet in length, and an inch in diameter, of a very beautiful appearance, their ſkin being variegated with a bright crimſon, yellow, and green, with a head ſhaped like the European ſerpent.

"The caſcabeles, or rattle ſnakes; and the culebras de bejuco,

or bejuco ſnakes, as they reſemble the colour of the bejuco, and from whoſe branches they hang down, and bite whatever diſturbs them.

" The hæmorrhous, which is common at Carthagena, and is called by its proper name. It is alſo common on the Spaniſh main and Muſquito ſhore, where there are other deadly venomous ſerpents; one ſpecies of which the Indians and inhabitants call Tomogos, and another the Barber's Pole, from the manner in which it is marked.

" Ulloa ſays, ' That a perſon bitten by the coral ſnake immediately ſwells to ſuch a degree, that the blood guſhes out through all the organs of ſenſe, and even the coats of the veins at the extremities of the fingers burſt, ſo that he ſoon expires.' *Book I. ch.* 7.

" Theſe effects have been generally thought to belong only to the bite of the hæmorrhous; but I believe the ſame effects are produced by all the tribe of deadly venomous ſerpents, and that there is no ſpecifical difference between them, except in the violence and rapidity by which the poiſon is diffuſed in the body; the reſt depending on the heat of the weather when the accident happens, and the ſtate and habit of body of the ſubject at that particular time.

" In the expedition from Jamaica in 1780, on the Spaniſh main, a ſoldier of the 79th regiment, in marching through the woods near San Juan caſtle, was bitten by a ſerpent, hanging from the bough of a tree, under the orbit of his left eye, from which he inſtantly felt ſo much pain that he was unable to proceed. He died in a few hours, with his body conſiderably ſwelled, and of a deep yellow colour. The eye near the bite was entirely diſſolved.

" The bite of the ſpecies of ſerpent called Ptyas, is ſaid to be followed by a tranquil laſſitude and ſleepineſs. Nicander ſays, thoſe who are bitten by it die in delightful tranſport. This induced Cleopatra to apply it to her boſom, that ſhe might end her voluptuous life by a voluptuous death *.

" F. Hoffman is one among a multitude who has been deceived by the falſe report of travellers on this ſubject. He ſays, ' In the iſlands of Cuba, Jamaica, and Hiſpaniola, the bites of ſerpents are highly injurious to the inhabitants.' But in this Hoffman is miſtaken; for though the Spaniards exterminated the human aborigines of theſe iſlands, their immenſe woods, and inacceſſible mountains to men, would have been the protection of ſerpents, if there had ever been any. But the Spaniards did not find any

* Galen relates, that ſhe made a deep wound in her arm with her teeth, and poured the poiſon into it, after having tried its fatal effects on her two faithful female attendants. *De Theriaca ad Piſonem, cap.* 8.

poiſonous ſerpents in theſe iſlands when they firſt went there, which Peter Martyr has properly recorded. *Decade I. lib.* 1.

"There are ſnakes in the iſlands, ſuch as the yellow ſnake, from eight to twenty feet in length; the large black ſnake, from four to twelve feet in length; and the ſmall black ſnake, and ſpotted ſnake, of about two or three feet in length. But the bites of theſe are not venomous, nor further troubleſome to cure than any other lacerated wound. Their depredations are confined to pantries, poultry, hens' and pigeons' neſts, young vermin, and reptiles. There are many fabulous ſtories related of the yellow ſnake attacking calves and lambs, and twining round other animals, and ſtrangling them: and that the amphiſbæna, or ſilver ſnake, has been found in the iſlands, and that its bite is venomous; but neither of theſe facts have been proved."

We ſhall now proceed to conſider the nature and treatment of thoſe wounds to which the poiſon of rabid animals has found acceſs, and alſo relate ſome curious effects which the accidental application of venereal matter to excoriated ſurfaces has been known to produce. In attempting the former, we ſhall, as much as poſſible, avoid the mention of circumſtances which more particularly belong to the firſt part of this work; though it will not be poſſible wholly to avoid repetition, and at the ſame time make ourſelves underſtood.

The Medical works of Dr. Ruſh, of Philadelphia, are too well known and eſteemed, both in Europe and America, to require any additional commendation. This original writer has lately publiſhed the fifth volume of his "*Medical Inquiries and Obſervations*," from which we have ſelected the following.—

The exertions of phyſicians to leſſen the number of incurable diſeaſes, form a ſplendid part of the modern hiſtory of medicine. Succeſs has not always crowned the endeavours directed towards this object; but no effort has been wholly loſt: and the improvements made, in many inſtances, have been ſuch as might be ſufficient to incite even the moſt tardy in this career of uſefulneſs.

The terrors of hydrophobia have long held poſſeſſion of the minds of men. Few inſtances of the ſucceſsful treatment of it are to be found upon record, and even theſe few are ſuppoſed by many to be of dubious authority. Our learned author, therefore, has not declined any difficulty in ſelecting the ſubject of theſe obſervations.

Dr. Ruſh aſſigns the following as ſome of the remote and exciting cauſes of hydrophobia: the bite of a rabid animal—cold night air—a wound in a tendinous part—putrid and impure animal food—worms, &c. And the theory of the diſeaſe, which an examination of its cauſes, ſymptoms, and accidental cures, has led him to adopt, is, that it is a *malignant ſtate of fever*. He is induced to think ſo from the febrile nature of the diſeaſe in all rabid animals—from its prevalence as an epizootic, at the ſame time that malignant

fevers are epidemic—from the reſemblance between the ſymptoms of canine madneſs and malignant fevers—and from the appearances of the bodies of dogs dead of the diſeaſe, as diſcovered by diſſection.

Dr. Ruſh concludes, that the diſeaſe produced in the human body, by the bite of a rabid animal, is of the nature of a malignant fever—from its ſymptoms—from its appearing, like a malignant fever, at different intervals after the time of receiving the infection—from the ſimilarity of the appearances of the blood, when drawn in both caſes—from the agreement of the diſeaſes in point of duration—from the equally rapid putrefaction of bodies dead of either diſeaſe—and from the ſameneſs of appearances in the dead bodies upon diſſection.

The remedies for hydrophobia are divided by our author into two kinds: Such as are proper to prevent the diſeaſe, after the infection of the rabid animal is received into the body. 2. Such as are proper to cure it when formed. Under the former head of remedies, he mentions cutting or burning out the wounded part—long and frequent affuſion of water—and keeping the wound open and running for ſeveral months. He recommends low diet as a means of prevention, and ſupporting the ſpirits and confidence of the patient; but he does not rely upon mercury for this purpoſe, as the diſeaſe has been known to come on, notwithſtanding a ſalivation.

As ſoon as the diſeaſe is diſcovered, Dr. Ruſh urges the uſe of blood-letting as the principal remedy, and adviſes that the quantity drawn be very copious. Many inſtances are adduced of the bold employment of this remedy with ſucceſs. Beſides blood-letting he recommends purges and clyſters, ſweating, and ſalivation by mercury. He alſo mentions caſes where muſk and opium, bark and wine, have been found efficacious remedies. Bliſters and ſtimulating cataplaſms, he ſuppoſes, may be uſeful in the decline of this diſeaſe, as they are in that of malignant fevers. The cold bath, alſo long immerſion in cold water, have produced beneficial effects.

It has been generally allowed by practitioners, that though the hydrophobia may be prevented, yet it can ſcarcely ever be cured after it has made its appearance. The moſt eſſential part of the treatment, therefore, depends on the proper uſe of means of *prevention*.

The great objects to be aimed at in prevention, are, in the firſt place, the complete removal of the contagious matter as ſoon as poſſible; or, ſecondly, means of deſtroying it at the part, where there is even the ſlighteſt reaſon to believe that it has not been completely removed. Of all the means of removal, the complete cutting out the part to which the tooth has been applied, is unqueſtionably the moſt to be depended upon. This practice, therefore, ſhould be had recourſe to as ſoon as poſſible. The ſooner it can be accompliſhed the better. But, as it has been obſerved, that a pecu-

liar ſenſation at the part affected always precedes the acceſſion of the diſeaſe, even when it takes place at a late period after the bite, there is good ground for believing, that removal of the part may be of advantage even after a conſiderable interval. But beſides removal of the contagious matter, by cutting away the part to which it is attached, this ſhould alſo be done by careful and long-continued waſhing. This may be done, in moſt inſtances, before a proper opportunity can be had of having recourſe to the knife. Cold water ſhould particularly be poured upon the wound from a conſiderable height, that the matter may be waſhed away with ſome force. Even after removal by the knife, careful waſhing is ſtill a neceſſary and proper precaution. And after both theſe, to prevent, as far as can be, the poſſibility of any contagious matter lurking about the wounded part, it ſhould not be allowed to heal, but a diſcharge of matter ſhould be ſupported for the ſpace of ſeveral weeks, by ointment with cantharides, or ſimilar applications. By theſe means there is at leaſt the beſt chance of removing the matter at a ſufficiently early period: and this mode of prevention ſeems to be of more conſequence than all others put together, which have hitherto been diſcovered. But beſides removal, prevention may alſo be attempted by the deſtruction of the contagious matter at the part; and where there is the leaſt reaſon to think, that a complete removal has not been obtained, theſe ſhould always be had recourſe to. With this intention, the actual cautery and burning with gunpowder have been employed. And the action of fire is probably one of the moſt powerful agents that can be uſed for this purpoſe. But recourſe has alſo been had to waſhing, both with acids and with alkalies: of the former kind, vinegar has been chiefly uſed, but more may probably be expected from the latter, and particularly from the cauſtic alkali, ſo far diluted that it can be applied with ſafety; for, from its influence as a ſolvent of animal mucus, it gives a better chance of a complete removal of the matter, independent of any influence in changing its nature. It has been thought alſo, that oil, applied to the part, may be of ſervice. But if recourſe be had to it, more active meaſures ſhould, at leaſt, be previouſly employed; and even then, ſome are of opinion that it is of advantage to increaſe the activity of the unctuous matter by combining it with mercury.

On theſe grounds, and by theſe means, we are inclined to think that the action of this contagion on the ſyſtem, after it has been applied by the bite of a rabid animal, may be moſt effectually prevented. But after this action has once taken place, no remedy has yet been diſcovered on which any dependence can be put. A very great variety of articles indeed have, at different periods, been held forth as infallible, both in the prevention and cure of this affection; but their reputation has, perhaps, univerſally been founded on their being given to people, who, though really bit by a mad dog, were yet not infected with the contagion: and this happily, either from

the tooth being cleaned in making the bite, or not being covered with contagious matter, is by no means an unfrequent occurrence. Mankind, however, even from the earlieſt ages, have never been without ſome boaſted ſpecific, which has been held forth as an infallible remedy for this affection, till fatal experience demonſtrated the contrary. Boerhaave has given a pretty full catalogue of thoſe ſpecifics from the days of Galen to his own time; and concludes, that no dependence is to be put in any of them. It is now, therefore, altogether unneceſſary to take notice of burnt crabs, the hyæna's ſkin, mithridate with tin, liver of the rabid animal, or a variety of other pretended remedies for this diſeaſe, proved by experience to be totally inefficacious. But although no greater confidence is, perhaps, to be put in remedies of modern date, it will be proper that theſe ſhould be mentioned.

Bathing in cold water, eſpecially in the ſea, and drinking ſea-water for a certain time, have been preſcribed, and by ſome accounted a certain preventive. When this was known to fail, a long courſe of antiphlogiſtic regimen, violent ſubmerſion in water, even to danger of drowning, and keeping the wounded place open with cauteries, were recommended. To this extreme ſeverity Dr. Mead objected; and in his treatiſe on this ſubject endeavours to ſhow, that in all ages the greateſt ſucceſs has been reaped from diuretics, for which reaſon he propoſes the following powder: "Take aſh-coloured ground-liverwort, half an ounce; black pepper, two drachms: reduce them ſeparately to powder, then mix them together." This powder was firſt publiſhed in the Philoſophical Tranſactions, by Mr. Dampier, in whoſe family it had been kept a ſecret for many years. But this medicine, which was inſerted in former editions of the London and Edinburgh Pharmacopœias, under the name of *Pulvis Antilyſſus*, has long loſt its credit.

There is a famous Eaſt-India medicine, compoſed of twenty-four grains of native, and as much factitious cinnabar, made into a powder with ſixteen grains of muſk. This is called the *Tonquin* medicine, and muſt be taken in a teacupful of arrack or brandy; and is ſaid to ſecure the patient for thirty days, at the expiration of which it is to be repeated; but if he has any ſymptoms of the diſeaſe, it muſt be repeated in three hours, which is ſaid to be ſufficient for a cure. The firſt doſe is to be taken as ſoon after the bite as poſſible.

Another celebrated remedy is *Palmarius's powder*, compoſed of the leaves of rue, vervain, ſage, polypody, wormwood, mint, mugwort, balm, betony, St. John's-wort, and leſſer centaury. Theſe herbs muſt be gathered in their prime, dried ſeparately in the ſhade, and then powdered. The doſe is a drachm, or a drachm and a half, taken every day.

A remedy which might promiſe to be more efficacious than any of thoſe hitherto mentioned is mercury, which has had many recommenders, particularly the late Dr. Houlſton of Liverpool, who, in

his "Treatise on Poisons," recites several cases which are apparently, though not really, decisive of it efficacy. It has been recommended in frictions, and to be taken inwardly in the form of calomel and turbith mineral, in order if possible to raise a slight salivation, on which the efficacy was thought to depend. Besides this, venesection, opium, the bark, and camphor, have been tried in very large quantities; the warm bath; and, in short, every thing which human invention could suggest; but with what success, can best be judged from the following well-authenticated cases:

In the beginning of December, 1728, a young gentleman, aged 17, was bit by a dog in the middle finger of the right hand, about the middle of the nail. In the beginning of January, 1729, he complained of pain in that finger, reaching along the back of the hand to the elbow. In the night, between the sixth and seventh days of that month, he became hot and restless: emollient and anodyne fomentations were applied; but the pain became very sharp, and the hydrophobia came on in the night-time. He was blooded: but became worse every hour, and at last quite furious and outrageous. The bandage was thrown off from his arm, and he lost about twenty ounces of blood, besides what had formerly been taken from him. This, however, caused no abatement of the symptoms, and he died the same night.

In 1753, a woman, seized with the hydrophobia in consequence of the bite of a dog supposed to be mad, was treated in the following manner by Dr. Nugent. First she was blooded to about fifteen ounces; she took fifteen grains of musk in powder, and along with it a pill of two grains of pure opium, every three hours. A plaster of galbanum, with half an ounce of pure opium, was laid to her neck and throat. She began to take these medicines on a Saturday morning, an hour or two after the dread of water had commenced. In the evening she was a little easier at intervals. The musk and opium pill were continued as before, and the hand that was bit was ordered to be chafed with warm salad oil several times a-day. Only two papers of powder and two pills were taken in the night, for the last made her sick and vomit. She had little or no sleep, but lay pretty quiet. On Sunday, twenty ounces of blood were taken away, and a clyster with antimonial wine injected: the pills and powders were continued as before. On Sunday evening she could swallow liquids a little better, and she lay quiet most of the night. On Monday her swallowing was greatly better. The musk and opium were continued, and twelve ounces more of blood were taken from her: the plaster was renewed with only two drachms of opium, and the oil was used as before. At night she was better; her hand easy; and by a continuance of these remedies she recovered.—This was the case which chiefly brought opium into reputation.

The following cases published by M. Desault, a Frenchman,

firſt brought mercury into reputation. Four men were bitten by the ſame wolf, on the ſame day, at the ſame hour. They were dipped in ſalt water, and came back perſuaded that they had nothing to fear. Some days after, one of them felt a numbed pain about his ſcars, while the ſcars themſelves grew hard, and roſe like an embroidery: he was ſoon after ſeized with the uſual ſymptoms, as was alſo another. The ſon of the former likewiſe began to feel a pain about the cicatrices, and a ſwelling with hardneſs; as did alſo the fourth. They were ordered to rub a drachm and a half of the mercurial or blue ointment upon the cicatrices and about the whole arm. This was repeated three days ſucceſſively, and then every other day: after the fifth friction, he allowed an interval of two days. Beſides this, they took every day a drachm and a half of Palmarius's powder. After the third friction the cicatrices grew flat and ſoft, the pain went off, their courage returned, and their mind reſumed its former tranquillity.

But how far mercury, or indeed any thing elſe, is from being a *ſpecific* in the hydrophobia, will appear from the following account of Dr. Wolf's patients. In the middle of April, 1767, ſeventeen people and a great number of cattle were bitten in the neighbourhood of Warſaw by a mad wolf. One of theſe, an officer, was brought into the city that ſame day, and had the beſt advice of the ſurgeons and phyſicians in that place; beſides which he took the bark very copiouſly with camphor. He continued well till the ſeventh week, when he became hydrophobous, and died.

Eleven of the others applied to Dr. Wolf on the ninth day. Their wounds were all deeply ſcarified; diligently waſhed and fomented with vinegar, ſalt, and theriaca; and kept open till the 80th day, in thoſe who lived ſo long. Every two weeks they were blooded largely, and were purged every week with ſalts and jalap. Their diet was moſtly vegetable, and their drink whey and water. They all eat as much as could be got of the herbs *matriſylva* and *anagallis flore puniceo*; and they all took often of the *pulvis Palmarii*. The *muſcus cinereus terreſtris* could not be got, or it would alſo have been preſcribed. Beſides the general treatment, two were rubbed daily with a drachm of mercurial ointment, and had their purges with calomel. Two took every day four ounces of vinegar, three drams of tincture of poppies, and half an ounce of *rob ſambuci*, every night. One took every day ſixteen grains of camphor, with four ſcruples of ſalt-petre, and at night half an ounce of *rob ſambuci*. Two took twenty-four grains of muſk, with fifty grains of cinnabar. Other two took from forty to ſixty drops of ſpirit of ſal ammoniac, prepared with quick-lime; and the laſt took a ſcruple of cryſtallized ſalt of tartar made by the mixture of a little ſpirit of ſal-ammoniac with a ſolution of that ſalt.

One of the firſt who uſed the mercurial ointment was ſeized with the hydrophobia on the 22d day, immediately after being well purged

with calomel. He was blooded copiouſly, plunged abundantly in cold water, and had ſeveral clyſters adminiſtered, without effect. Two pounds of oil, and as much of drink, were poured down by force; alſo a drachm of ſalt of tartar, and half a drachm of muſk were given in three doſes. He then began to drink freely, but died the third day. His companion then left off the uſe of mercury, and took eighty drops a-day of Dippel's animal oil, till he had taken ſix drachms of it; after which he went on with 100 drops daily of ſpirit of ſal-ammoniac made with alkali.

One of thoſe who took the vinegar fell ſick the 33d day. He was immediately blooded, and vomited with ipecacuanha. This man was too ſtrong to make experiments on by force: he refuſed every thing, and died the third day. His companion, an old man, began to be ſeized in the ſame manner: he was purged with ſalts, took the *morſulæ balſami Peruviani*, and drank lemonade. He recovered, and uſed afterwards 100 drops of ſpirit of ſal-ammoniac daily. This was the patient formerly mentioned, whoſe blood had the fetid ſmell.

The man who uſed the camphor fell ſick the 33d day. He was thrice copiouſly blooded, was plunged forcibly into the coldeſt water for the ſpace of two hours, and was nearly drowned. He was clyſtered with effect. He himſelf forced down, with incredible averſion and labour, a great quantity of drink; by which he vomited, more than fifty times, abundance of frothy ſlime. He took ſeveral ounces of oil, and ſeveral boluſes of caſtor and opium, of each four grains, without effect; and died the fourth day.

A girl who uſed the muſk with cinnabar, fell ill the 62d day, and died the third day after. No farther attempt was made to ſave her life, ſhe being then at a diſtance. Her companion, a pregnant woman, then left off the muſk, and took in its ſtead ſpirit of ſal-ammoniac.

A woman who had taken nothing, fell ill on the 40th day. She ſuffered terribly in the night, but leſs in the day time. Beſides the uſual ſymptoms, ſhe had great pain and ſwelling in her belly. In the ſpace of two days ſhe drank about two bottles of brandy, but would taſte no other liquor. The doctor ordered her to mix an equal quantity of oil with her brandy, and to take every day two boluſes of caſtor and opium. She recovered; and at laſt took two doſes of turbith-mineral, by which ſhe was vomited and purged.

After the 80th day, all the ſurviving people took thrice the turbith mineral, except the pregnant woman; and they afterwards continued their alkaline medicines to the 100th day.

On theſe caſes Dr. Wolf makes the following obſervations. —"Thus we ſee, that the bark, the mercury, the acids, the muſk, the feeding on the moſt famous herbs, the ſweating, the *cura antiphlogiſtica*, are no ſpecifics. I don't know what to ſay to the alka-

lies: the danger is not yet over; and there are ſtill four people who uſed nothing, in as good health as my patients."

The following caſe by Dr. Raymond of Marſeilles, ſhows the inefficacy of mercury even as a *preventive*. On the 19th of July, 1765, Mr. Boyer, aged 25, of a bloated cachectic habit, was bit by a mad dog in the inferior part of the leg; the wound extended half way round, bled freely, and was like a great ſcratch. The patient's legs had been ſwelled for a conſiderable time before the accident; and there were alſo two ulcers in the other leg. Some hours after the accident, the actual cautery was applied to the wound. The doctor was not preſent at this operation; but the part around the bite was rubbed with mercurial ointment immediately after, and the eſchar was dreſſed with the ſame ointment. The eſchar was ſeparated on the firſt day, but the dreſſing was continued till the wound was cicatriſed. The ſecond day a bolus of four grains of turbith and eight grains of camphor was exhibited. This procured a conſiderable evacuation, both by vomit and ſtool, and a ſpitting alſo came on. The third day the bitten leg was rubbed with mercurial ointment: in the ſpace of a month the frictions were repeated five times on both legs, three drachms of mercurial ointment being uſed in each friction. During the ſame time the bolus was five times repeated; and this treatment kept up a ſlight ſalivation to the 40th day. The evening of the third day he took the *Tonquin medicine*, called alſo *Sir George Cobb's powder*, in a bolus; which vomited him briſkly. This powder was repeated ſeven or eight times in the month, generally with the ſame effect. During the firſt ſeven or eight days he got four times, in the morning, a drachm of the *anagallis flore punico*, freſh gathered and powdered. The 41ſt day, the turbith bolus was preſcribed for the ſeventh time; he was bathed in the ſea, and continued the bathing for two days more. On the 74th he was ſeized with the diſtemper: and died on the 76th, ſeemingly ſuffocated or ſtrangled, his mouth covered with ſlaver, and his face bloated. He loſt his ſenſes not above half a quarter of an hour before his death. The pulſe was quiet the whole time. The doctor ſays he has reaſon to ſuſpect the wound was not well cauterized.

Another inſtance is mentioned by the ſame author, of a pregnant woman bit by the ſame dog, and on the ſame day with Mr. Boyer, who was never ſeized with the diſtemper. She was treated in much the ſame manner with him, and ſalivated a little more. But ſhe was bit through a ſhamoy leather ſhoe, which muſt neceſſarily have cleanſed the animal's teeth of the poiſonous ſaliva, before they reached her ſkin, and to this we are naturally led to aſcribe her ſafety. One of Dr. Wolf's patients alſo was a pregnant woman, and was not ſeized with the diſtemper. Perhaps women in a ſtate of pregnancy may be leſs liable to this diſtemper than others: but it is more probable that the contagion was not communicated.

The ſame author tells us, "there are many examples of the inefficacy of mercurial frictions. A ſurgeon of Marſeilles treated a girl about twelve years of age, bit by a mad dog, with mercurial frictions; applying them as in the *lues venerea*; yet ſhe died of the hydrophobia on the 55th day. Her wound was not cauterized."

In the following caſe all the moſt powerful remedies were tried:—In the afternoon of the 29th of Auguſt, 1778, Dr. Vaughan was called to a boy of eight years of age, labouring under a hydrophobia. He had been bit on the wriſt by a cat, about a month before; of which the marks remained, but without any ulcer, or even the ſmalleſt appearance of inflammation. About the middle of the day before Dr. Vaughan ſaw him, he began to complain of a pain in the part bitten, which aſcended up the arm, and affected the temple on that ſide; ſoon after which he ſwallowed liquids with reluctance and difficulty. He was put into a warm bath for three quarters of an hour, during which time he was eaſier: he had a clyſter of five ounces of freſh broth, and thirty drops of laudanum, injected immediately after his coming out of it; a liniment, conſiſting of three drachms of ſtrong mercurial ointment, with the ſame quantity of oil of amber, was rubbed upon the ſhoulders and back; two pills, of a grain of flowers of zinc, and half a grain of *cuprum ammoniacum*, were taken every three or four hours; and a medicated atmoſphere was prepared for him, by burning gum ammoniac in his room. As theſe remedies were not attended with any good effect, each doſe of pills was ordered to contain two grains of *cuprum ammoniacum*, the ſame quantity of opium, three grains of flowers of zinc, and ten grains of aſſafœtida; whilſt a ſolution of that fœtid gum, with a drachm of laudanum, was adminiſtered as a clyſter. Theſe pills, though repeated every four hours, afforded not the ſmalleſt relief, nor did they ſhow the leaſt action on the frame. At laſt the doctor reſolved to put in practice the deſperate remedy mentioned by Van Helmont, of throwing the patient into cold water, and keeping him there till he was almoſt drowned. With this view, a large tub of cold water, well ſaturated with common ſalt, was prepared, into which the poor boy was plunged over head and ears, and there held until he ceaſed to ſtruggle. He was then taken out again, and the ſame operation repeated, until he became ſo quiet, that the doctor was under apprehenſions that a total extinction of life would take place. He was then wrapt up in a blanket, and put to bed, and he remained more quiet than he had formerly been; but all his reſtleſſneſs ſoon returned, his pulſe ſunk, and he died about two o'clock in the morning.

Another celebrated antidote againſt the poiſon of a mad dog, hath been known for ſome years by the name of the *Ormſkirk medicine*. The true compoſition of this is kept a ſecret by the proprietors: however, it has been analyſed, and the following

compoſition publiſhed by Dr. Heyſham, as perfectly ſimilar to it in all reſpects.

"*Take half an ounce of chalk, three drachms of Armenian bole, ten grains of alum, one drachm of elecampane in powder; mix them all together, and add ſix drops of oil of aniſe.*"

They muſt certainly be very credulous who can put confidence in ſuch an inſignificant medicine as a preſervative againſt the hydrophobia: however, there is a poſſibility that there may be ſome unknown ingredient in the genuine powder; for it is difficult to analyſe powders after the ingredients are thoroughly mixed together. The efficacy of the medicine, therefore, muſt depend on the virtues of that unknown ingredient, if any ſuch there be. The following caſes however, too well determine that it it not *infallible*, as was at firſt pretended. In all probability, as well as many others, its reputation alſo is ſolely reſted on its being exhibited in many caſes where no contagion was communicated to the perſon bit, and where of courſe no diſeaſe could take place.

On the 14th of February, 1774, Mr. Bellamy of Holborn, aged forty, was bit by a cat, which was killed the ſame morning. The following day he took the celebrated Ormſkirk medicine, ſold by Hill and Berry, in Hill-ſtreet, Berkeley-ſquare, and conformed in every reſpect to the directions given by the vender. A ſervant-maid, who was bitten in her leg before her maſter was bitten, likewiſe took the ſame remedy. About the middle of April, Mr. Bellamy complained of a pain in his right knee, which he ſuppoſed to be rheumatic, and which continued and increaſed till the 7th of June, when he got ſome pills of calomel, ipecacuanha, and *pil. ſapon.* from an apothecary, with Huxham's tincture of the bark in ſmall doſes. In ſix days more he had a titillation in the urethra, a contraction of the ſcrotum and penis to a degree of pain, and an emiſſion of ſemen after making water, to which he had frequent calls. The medicines were diſcontinued, and on the 16th of that month the hydrophobia came on, and Dr. Fothergill was called. Six ounces of blood were taken from his arm, and a bolus of a ſcruple of native cinnabar and half a ſcruple of muſk was given every four hours. The diſtemper manifeſtly increaſed through the day. In the evening a clyſter was injected, and ſeveral times repeated during the night; he had been put into the warm bath, and two drachms of ſtrong mercurial ointment rubbed into his legs and thighs by himſelf. He was greatly relieved by the warm bath while he continued in it, but the ſymptoms returned with increaſed violence in the night. The next day, being greatly worſe, he was blooded to as great a quantity as he could bear, had the warm bath and clyſters repeated, and half an ounce of mercurial ointment rubbed into his thighs and legs. Pills of opium were preſcribed, but he did not take them. He died the ſame night, at half an hour after twelve. This patient was a man of great reſolution, and

could in part conquer his averſion to water. He ſeemed to have totally forgot the accident of the bite; and caſually ſaid, he thought his diſorder reſembled the hydrophobia, without ſuppoſing that he was afflicted with that diſtemper at the time. The bite on the girl's leg refuſed to heal, baffled the art of a young ſurgeon who attempted to cure it, and continued a running ulcer for a long time. She did not fall into the hydrophobia. Hence Dr. Fothergill thinks it probable, that keeping the wounds made by the teeth of mad animals open for a long time, would probably be of ſervice as a preventive; but in ſome of Dr. Wolf's patients, theſe artificial drains appear not to have been attended with ſucceſs.

On the 16th of November, 1773, Thomas Nourſe, a ſtrong healthy boy of fourteen, was admitted into the Leiceſter infirmary, having been that day month bitten by a mad fox-hound. The wound was a large lacerated one on the cheek, and bled very freely on being inflicted. The day after he was bit he went to the ſea, where he was dipped with all the ſeverity uſually practiſed under ſo diſagreeable an operation. The *Ormſkirk medicine* was alſo adminiſtered with all due care. It was bought of a perſon in Leiceſter who is deputed by the proprietor to ſell it for him. A common adheſive plaſter was applied to the part after ſea-bathing; and in the courſe of a month, without any farther trouble, the wound was healed; excepting a ſmall portion, ſomewhat more than an inch in length, and in breadth about one tenth. This yielded no diſcharge, and was quite in a cicatrizing ſtate. Five days before his admiſſion into the infirmary, he began to complain of a tightneſs over his temples, and a pain in his head: in two days the hydrophobia began to appear; and at its commencement he complained of a *boiling heat* in his ſtomach, which was continually aſcending to the fauces. The diſeaſe was pretty ſtrong when he came to the infirmary. He got a bolus of a ſcruple of muſk with two grains of opium; then a compoſition of fifteen grains of muſk, one of turbith mineral, and five grains of opium, was directed to be taken every third hour; an ounce of the ſtronger mercurial ointment was to be rubbed on the cervical vertebræ and ſhoulders, and an embrocation of two ounces of laudanum, and half an ounce of *acetum ſaturninum*, was directed to be applied to the throat. But by this laſt he was thrown into convulſions, and the ſame effect followed though his eyes were covered with a napkin. The embrocation was, therefore, changed for a plaſter of three drachms of powdered camphor, half an ounce of opium, and ſix drachms *confectio Damocritis*. By theſe medicines the diſeaſe ſeemed to be ſomewhat ſuſpended, but the ſymptoms returned with violence in the evening. His medicine was repeated at ſeven; and at eight five grains of opium were exhibited, without muſk or turbith. At nine, another ounce of mercurial ointment was rubbed upon the ſhoulders, and half an ounce of laudanum with ſix ounces of mutton-broth was injected

into the inteſtines, but to no purpoſe. A larger doſe of opium was then given, but with as little effect as the former, and he died the ſame night.

In the month of September, 1774, a farmer, aged twenty-five, was bit by a mad dog, whoſe teeth made a ſlight wound in the fore-finger of the left hand. He was dipped, as uſual, in the ſea; and drank the ſea-water for ſome time on the ſpot, which operated briſkly as a purge. He continued well till the ſixth of June following, when he firſt felt a pain in that hand and arm; for which he bathed in a river that evening, ſuppoſing that it had been a rheumatic complaint. The next day he was ſick; and in the evening was ſeized with a violent vomiting, which continued all that night and till the middle of the next day, when it was ſucceeded by the hydrophobia. He was treated with the warm bath; had a purgative clyſter injected; and as ſoon as it had operated a ſecond was given, conſiſting of four ounces of oil, and half an ounce of laudanum: half an ounce of ſtrong mercurial ointment was rubbed on the fauces, and the part was afterwards covered with the *cataplaſma e cumino*, to which was added an ounce of opium. An embrocation was applied to the region of the ſtomach with continued friction, conſiſting of half an ounce of ſpirit of ſal ammoniac, ten drachms of oil of olive, ſix drachms of oil of amber, and ten drachms of laudanum. Two ounces of ſtrong mercurial ointment were rubbed upon the ſhoulders and back; and as a further means of kindling a ptyaliſm ſpeedily, he received the ſmoke of cinnabar into his mouth, by throwing a drachm of that ſubſtance now and then upon a hot iron: he was alſo directed to take every four hours a bolus of fifteen grains of muſk, three grains of turbith mineral, and four grains of opium. He was eaſier while in the warm bath, and during the application of the ointment; but died the ſame night about two o'clock.

Many other inſtances might be adduced of the inefficacy of this pretended ſpecific: the danger of acquieſcing in which will, it is hoped, create a due degree of caution in thoſe to whom they who are ſo unfortunate as to be bit with a mad animal may commit themſelves. Another remedy may alſo be mentioned, as having had the reputation of being ſometimes ſucceſsful in this diſeaſe; which is chiefly employed in different parts of India, particularly in the territory of Tanjore. The medicine to which we now allude contains, indeed, ſeveral articles which are altogether unknown in our materia medica: but it contains at leaſt one very powerful ſubſtance well known to us, viz. arſenic. This medicine, known by the name of the Snake pills, as being principally employed againſt the bite of the moſt venomous animals, is directed to be prepared in the following manner:

Take *white arſenic*, of the roots of *nelli navi*, of *nuvi viſham*, of the [illegible]ls of the *ner vallum*, of *pepper*, of *quickſilver*, each an

equal quantity. The quickſilver is to be rubbed with the juice of wild cotton, till the globules are perfectly extinguiſhed. The arſenic being firſt levigated, the other ingredients reduced to a powder, are then to be added, and the whole beat together with the juice of the wild cotton to a conſiſtence fit to be divided into pills.

Though theſe pills are principally uſed againſt the bite of the cobra de capello, yet they are alſo ſaid to be ſucceſsful in the cure of other venomous bites; and for the prevention of rabies canina one is taken every morning for ſome length of time. Of this remedy European practitioners have, we believe, as yet no experience; and if, in the accounts tranſmitted by the Eaſt-India practioners, it cannot be ſaid that we have authentic evidence of its want of ſucceſs, it can as little be pretended that there is indubitable evidence of its efficacy in any inſtance; and it is by no means improbable, that it will be found equally inefficacious with others at one time conſidered as infallible, and far more hazardous.

Of the great variety of remedies which have had their day of reputation, there is not one which has not poſſeſſed the credit, ſome time or other, of preventing the noxious effects ariſing from the bite of a mad dog. A more adequate experience has, with all of them, diſcovered the deception. It was above obſerved, that the hydrophobia is by no means the infallible conſequence of being bit by a mad animal; and that of between twenty and thirty perſons, who were bit by the dog which gave the fatal wound to one of Dr. Vaughan's patients, not one felt the leaſt ill effect but himſelf. "In the above number," ſays the doctor, "were ſome who took the Ormſkirk medicine; others went to the ſalt-water; and a part of them uſed no remedy, who yet fared equally well with the moſt attentive to their injury. The ſame thing has often happened before; and much merit, I doubt not, has been attributed to the medicine taken, from that celebrated one of *Sir George Cobb* down to the *infallible* one which my good *Lady Bountiful*'s receipt-book furniſhes."

From all that has been ſaid, the reader will judge how far the hydrophobia is capable of being ſubdued by any of the medicinal powers which have yet been tried. Some eminent phyſicians aſſert that it is totally incurable; and allege that the inſtances recorded by different authors of its cure, have not been the genuine kind, but that which comes on ſpontaneouſly, and which is by no means ſo dangerous. Indeed two of Dr. Wolf's patients recovered, where the diſeaſe ſeems to have been perfectly genuine: but in theſe the poiſon ſeemed to vent itſelf partly, on ſome other place beſides the nervous ſyſtem. In one, the blood was ſeemingly infected, as it had an abominable fœtor; and the other had a violent pain and ſwelling in the belly. In all the others, it ſeemed to have attacked only the nervous ſyſtem, which perhaps has not the ſame ability to throw off any offending matter as the vaſcular ſyſtem.

There is, however, a poſſibility that theſe prodigious affections of the nerves may ariſe only from a vitiated ſtate of the gaſtric juices; for it is well known, that the moſt terrible convulſions, nay the hydrophobia itſelf, will ariſe from an affection of the ſtomach, without any bite of a mad animal. This ſeems to be ſomewhat confirmed from one of Dr. Wolf's patients, who, though he vomited more than fifty times, yet ſtill threw up a frothy matter, which was therefore evidently ſecreted in the ſtomach; juſt as a continual vomiting of bilious matter, ſhews a continual and extraordinary ſecretion of bile. Dr. Wolf himſelf adopts this hypotheſis ſo far as to ſay, that perhaps the *ſerum* may become frothy; but in blood drawn from a vein, not the leaſt fault appears, either in the ſerum or craſſamentum. He affirms, however, that the duodenum appears to be one of the parts firſt and principally affected; and, as it is not inflated, it would ſeem that the affection it ſuſtains muſt ariſe from the vitiated ſtate of its juices.

Be this as it will, however, in the hydrophobia, the ſtomach ſeems totally, or in a great meaſure, to loſe the power which it at other times poſſeſſes. Two grains of *cuprum ammoniacum* were repeatedly given to a child of eight years of age, without effect; but this doſe would occaſion violent vomiting in a ſtrong healthy man. Something or other, therefore, muſt have prevented this ſubſtance from acting on the nervous coat of the ſtomach; and this we can only ſuppoſe to have been the exceedingly diſordered ſtate of the gaſtric organs, which occaſioned ſuch violent irritation through the whole body, that the weaker ſtimulus of the medicine was entirely loſt. It would ſeem proper, therefore, to conſider the ſtomach in hydrophobic caſes, as really containing a glutinous matter, which could not be expelled by vomiting, becauſe it is renewed as faſt as evacuated. The indication, therefore, muſt be, to change its nature by ſuch medicines as are certainly more powerful than the gluten: and this indication will naturally lead us to think of large doſes of alkaline ſalts. Theſe, it is alleged, will deſtroy any animal ſubſtance with which they come in contact, and render even the poiſon of ſerpents inactive. By exhibiting a few doſes of them, larger no doubt than what could be ſafely done on other occaſions, we ſhould be certain to change the ſtate of the ſtomachic juices; and thus might free the patient from thoſe intolerable ſpaſms, which always occaſion death in ſuch a ſhort time. Dr. Wolf ſeems inclined to think, that volatile alkalies were of ſervice; but the above hypotheſis would incline us to uſe rather the fixed kind. At any rate, it ſeems vain for phyſicians to truſt much to the power of opium, mercury, muſk, or cinnabar, either ſingly or combined, in any poſſible way. The bark has alſo failed, and the moſt celebrated ſpecifics have been found ineffectual. Alkalies are the next moſt powerful remedies which the *materia medica* affords, and they cannot be more unſucceſsful than the others have generally been.

Another remedy which seems adapted to change the nature of the gastric juices is ardent spirits. In one of Dr. Wolf's patients, two bottles of brandy seem to have effected a cure. The oil mixed with it was of no efficacy in other cases, and the opium and turbith seem not to have been exhibited till the worst was past. In this case, the disease seems to have attacked the vascular as well as the nervous system.

In all the patients, the warm bath seems to have been a palliative, and a very powerful one, and as such it ought never to be omitted, though we can by no means trust to it as a radical cure; and the above histories abundantly show, that though the warm bath and opium may palliate, for a short time, the cause on which the spasms depend is still going on and increasing, till at last the symptoms become too strong to be palliated, even for a moment, by any medicinal power however powerful. At any rate, the above-mentioned hypothesis suggests a new indication, which, if attended to, may perhaps lead to useful discoveries. In cases where putrescent bile is abundantly secreted, colombo root and vegetable acids are recommended, to change the nature of the poison which the body is perpetually producing in itself. Where corrosive mercury hath been swallowed, alkaline salt is recommended to destroy the poison which nature cannot expel by vomiting; and why should not something be attempted, to destroy the poison which the stomach seems to secrete in the hydrophobia, and which nature attempts to expel, though in vain, by violent efforts to vomit?

But whatever plan may be pursued, in the hopes of curing this dreadful malady after any of the symptoms have made their appearance, we ought, in every instance of the accident that gives rise to it, to direct our immediate care to *prevention*, as being perhaps the only real ground of hope:—and the most certain and efficacious way of preventing the ill consequences, is instantly (if it may be done) to cut out the piece in the place that happens to be bitten. Dr. James, indeed, says, that he would have little opinion of cutting, or cauterising, if ten minutes were suffered to elapse from the receiving of the bite before the operation was performed. But in an inaugural dissertation, lately published at Edinburgh by Dr. Parry, the author is of opinion that excision will be of use a considerable time after the bite is received. He adopts this opinion from what happens in the small-pox, where the blood does not seem to receive the infection till some days after inoculation has been performed. A second inflammation, he tells us, then takes place, and the infection is conveyed into the blood. In like manner, when the hydrophobous infection is about to be conveyed into the blood, according to him, the wound, or its cicatrix, begins again to be inflamed; and it is this second inflammation which does all the mischief. Excision, or the cautery, will therefore be effectual at any time betwixt the bite and the second inflammation of the wound. Without implicitly trusting

to this doctrine, however, or considering it as in any degree ascertained in what manner the poison diffuses itself, by what marks its progress may be known, or how soon the system may be irremediably tainted with its malignity, it is undoubtedly safest not to lose unnecessarily a moment's time in applying the knife. This, or a dilatation of the wound, if it be small, Dr. Vaughan considers as the only prophylactics that can be depended upon. In the latter case, he directs to fill the wound with gunpowder, and set fire to it; which would produce a laceration of the part, and possibly the action of ignited powder upon the poison may have its use. In all cases, likewise, after these practices have been employed, the wound should be prevented from healing, for some length of time, by the occasional application of lunar caustic.

Ulcers, to which *venereal virus has been applied*, whether externally, or through the medium of the circulation, are known by the peculiar character which venereal ulcers always assume, and which no surgeon is unacquainted with. When the poison has been received upon a slight cut or scratch (as of the finger in midwifery), an immediate application of lapis septicus may stand a chance of removing the virus, before any of it is absorbed; but if this remedy comes too late, it is obvious that no other course can be pursued but that of administering mercury, as in a lues venerea.

Dr. Haygarth, of Bath, has communicated to the editors of the Medical and Physical Journal, an account of some very singular effects produced on the constitution by venereal virus, locally applied. He says, "In three successive instances, I have observed, that the venereal poison applied to a finger, has produced a *low nervous fever*. How far such an effect of this manner of infection is noticed by authors, I have not leisure to enquire; it is certainly not generally known, nor suspected. In all the following cases, my patients were surgeons and accoucheurs in extensive practice.

Case I.—"I was desired to visit a medical friend on the 25th of September, 1791. For a month he had observed a brownish, moveable tumor, of the size and shape of a horse-bean, on the back of the index of the right hand. It had remained in the same state for many days; then it gradually became more painful. Ten days before I saw him it had broken, and discharged a serous fluid. For five days past, he had observed a painful tumor in the right arm-pit, with a red, painful, and swelled line, which could be traced up the arm to the axilla, in the course of the lymphatic absorbents. At times he felt a violent pain, darting from the ulcer of the finger up the arm, to the axillary gland. At the end of a month, from the first appearance of the swelling on the finger, it became ulcerated, without any previous regular suppuration, and the sore had an ugly spongy aspect, with an irritable and extremely painful surface.

"For three days previous to my first visit, he had felt the symp-

toms of a low nervous fever; as, alternate chilly and burning fits; ſhort but profuſe ſweats; laſſitude; extreme depreſſion of ſpirits; and a ſlight delirium.

"On firſt viewing the ulcer, I was ſtruck with the idea that it was venereal. But fever, which appeared to be connected with the ulcer, was thought to be ſo unuſual a connection, as conſiderably to diminiſh the probability of ſuch a cauſe. The fever alſo formed a ſtrong objection to the uſe of mercury. My patient had an excellent underſtanding, and had been long engaged in extenſive practice. He very judiciouſly urged theſe points with me. Among other arguments, he obſerved that the ſkin where the tumor and ſubſequent ulcer had formed, had previouſly ſuffered no injury, but was perfectly ſound.

"After diſcuſſing this point with my patient for about five days, during which the ulcer increaſed in ſize and ſoreneſs, I obtained his conſent to uſe mercury. But, juſt at this time (on the 30th of September), he had a violent ſhuddering fit, with an increaſe of his other febrile ſymptoms. A general efflorescence immediately appeared, and more particularly on the face, which had manifeſtly a venereal aſpect.

"Such a formidable acceſſion of fever, at this critical time, induced me to ſuſpend the uſe of mercury till the 4th of October. During this interval of four days, the venereal blotches appeared, which clearly confirmed my former opinion of the nature of the poiſon. The ulcer rapidly advanced ſo as to endanger the loſs of two joints of the finger. To preſerve them, and the life of my friend, which at that time were both in the moſt perilous ſituation, the mercurial ointment was employed in larger quantity than, I believe, I ever directed in any other caſe. Salivation was excited. The ulcer healed in October, but violent ſhooting pains remained in the hand and arm.

"At this time he was induced to attend ſome preſſing engagements in his profeſſion, though greatly fatigued with the leaſt exertion, and many of the venereal ſores, particularly on the face, were not healed. After going about for ſome weeks, he was ſeized with ſuch a violent pain in his legs and knees that he could never obtain ſleep for fifteen minutes together. He had the firſt night of good ſleep in the middle of April, after a long courſe of mercury, and the compound decoction of ſarſaparilla.

"It is hardly neceſſary to obſerve, that this long-protracted diſeaſe plainly proceeded from the urgent profeſſional duties in town and country, by day and night, which my patient was anxious to fulfil, ſo as to interrupt the ſeaſonable and regular uſe of proper remedies.

CASE II.—"I was conſulted by another eminent ſurgeon and accoucheur, on the 9th of May, 1792. On the point of the fore-finger of his right hand there had been a ſlight wound. For eighteen

days it had gradually become a ſpongy and painful ulcer. In the axilla he had perceived a tumor which gave him conſiderable pain. He had chilly fits, with a ſenſe of much debility, being ſcarcely able to walk to my houſe.

"On this occaſion I aſſured my patient that his diſorder proceeded from venereal infection. My opinion was deciſive; not only from the appearance of the ulcer, but was much ſtrengthened and confirmed by my experience in the former caſe. He argued, and judiciouſly, from many ſymptoms which he enumerated, that he had a typhus fever; he aſcribed it to ſome putrid abſceſſes which he had lately opened. In conſequence of this idea, he thought that bark and wine were his proper remedies. With opinions totally oppoſite to each other, we ſeparated; but he ſoon returned to me, and conſented to begin a mercurial courſe, with a decoction of ſarſaparilla. I have reported in my caſe book, on May 27th, that he had uſed the remedies, but not regularly; that the wound of his finger was nearly healed, and the axillary tumor almoſt gone. The pain had ceaſed. He was deſired to continue the remedies; and his health was ſoon reſtored.

"Some time after our firſt conſultation on the caſe, my patient acquainted me, that a woman whom he had lately delivered, had applied to him to cure her of ſome venereal ulcers. He entertained not a doubt that he received the venereal infection from theſe ulcers.

CASE III.—"On the 19th of May, 1794, I was conſulted by another accoucheur. I have noted, that a wound of a finger of his left hand had received a venereal infection three weeks ago. He complained of laſſitude, proſtration of ſtrength, giddineſs, and ſenſibility to cold. For a fortnight, he had perceived a tumor in a lymphatic gland above the elbow, and in another near the elbow. I adviſed Ung. Hydr. 3 ß every night, with decoct. ſarſap.

"April 8th, he had uſed eight ſcruples of mercurial ointment. His health had improved. The lymphatic glands, lately ſwelled and painful, were relieved.

"April 19th, he had uſed an ounce of the mercurial ointment. He was recovering; but the ulcer of his finger ſtill remained red and ſwelled. He was deſired to continue the remedies.

"Thus, in three ſucceſſive caſes, the venereal poiſon applied to a finger, produced ſordid, ſpongy, painful, phagedenic ulcers; inflamed lymphatic abſorbents and glands; and manifeſt ſymptoms of a low nervous fever.

"Accoucheurs ought to be fully aware of the danger to which their health and lives are ſo much expoſed. I have very ſeldom witneſſed an inſtance where the life of the patient was reſcued from more imminent danger than in the firſt caſe above related. Since theſe events have occurred to my obſervation, a painful doubt has frequently ariſen in my mind, whether the death of my much-

lamented friend, Hewſon, might not be aſcribed to ſuch a fatal miſtake."

The author is anxious for the means of forming ſome general eſtimate, whether ſuch a fever *frequently*, or *but ſeldom*, accompanies the introduction of this poiſon into the ſyſtem, when applied to a finger, lip, &c. On the 16th of October, 1769, Dr. Haygarth alſo attended a young lady, whoſe caſe he has noted thus: "For five weeks ſhe had a callous ulcer on her upper lip, probably venereal, with red and rough eruptions on her face and body. Pulſe 100, chilly on expoſure to cold. She feels a ſenſe of fatigue, but yet can walk and ride." He concludes by ſuppoſing, that fever is not the uſual conſequence of this mode of receiving the venereal infection; otherwiſe, he apprehends, it muſt have been more generally known among medical men. At any rate, the caſes he has related will give an uſeful warning to ſurgeons and accoucheurs; they will, on a like occaſion, be aware of the danger, and be prepared with a proper remedy.

Wounds inflicted by *poiſoned weapons* of any kind, are of courſe equally dangerous with the bites of venomous animals. Dr. Mead tells us, that the Indians dry the poiſon bladders of thoſe deadly ſerpents called *cobra de capello*, and grinding them to powder, make it up into paſte, with which they anoint their arrows. Mr. Bancroft alſo, in his Natural Hiſtory of Guiana, informs us, that the arrows with which the Indians in that part of the world hunt wild beaſts, are anointed with a vegetable poiſon, which, however, proves no leſs fatal than the moſt violent of the animal kind; and it is ſaid that the fleſh of the animal killed in this manner becomes very ſoft and tender, owing to an incipient putrefaction, which inſtantly takes place throughout the whole body. As the Indians never employ theſe weapons in war, the effects of it on the human body are not well known. Mr. Bancroft, however, had an opportunity of ſeeing an Indian, whoſe ſkin had accidentally been ruffled by one of theſe poiſoned arrows, but without drawing blood. On this he conſulted with ſome of the moſt intelligent people he could find, but they aſſured him that they knew of no remedy for the poiſon; but added, that the Indian would not die, as no blood had been drawn. The event verified their prediction. A violent inflammation enſued in the limb which had been ſcratched, and an equally violent inflammatory fever threatened the deſtruction of the patient; but he got better next morning. Hence we may conclude, that this poiſon operates in a manner ſimilar to that of a ſerpent, and, when in ſufficient quantity, admits of no cure; as death comes on ſo quickly, that none could be applied, even if it were known. M. Fontana informs us, that a ſmall quantity of ſolution of this poiſon, injected into the vein of an animal, killed it like lightning, even before he thought that the injection had time to paſs from the ſyringe. As to a cure, he does not mention any; and indeed, in

caſe of an accidental wound with any of theſe arrows, the only thing that ſeems to have the ſmalleſt chance of ſucceſs, is a ſtrong ligature to intercept the paſſage of the virus, and ſucking out the poiſon. This may indeed ſeem a dangerous operation; yet, from the concurrent teſtimony of authors, we find it has been performed with ſucceſs, and without any ill conſequences to the operator. We have a remarkable inſtance, indeed, in Edward I. of England; who, having been accidentally wounded with a poiſoned arrow, his queen, it is ſaid, ſucked out the poiſon, and thus ſaved the king's life, without any injury happening to herſelf.

Natural hiſtory has not yet appriſed us of any other poiſonous ſubſtances, that may produce deleterious effects when mixed with the blood; nor, indeed, can this be known without a great number of experiments, for the cruelty of which, it is very doubtful, whether the addition made by them to ſcience, could make ſufficient recompence. Oil of tobacco, inſerted into a ſmall ſcratch of the body of a fowl, will kill it in a very ſhort time; but whether it would have the ſame deleterious effects upon large animals, or on the human ſpecies, is not known. Mineral poiſons are not found to exert their malignant properties, unleſs received by the ſtomach, and therefore do not come within our notice in this place.

Poiſons which are foreign to the body, are not, however, the only deſtroyers of human life. There are others, which in ſome caſes are greatly to be dreaded, and that ariſe from the body itſelf. Of this kind we may reckon the contagion of the plague, and other infectious diſeaſes; but, as theſe cannot be prevented by any external application to the body, we muſt refer them to the conſideration of the phyſician. Putrid animal matter forms another poiſon, of which ſurgeons and anatomiſts have frequently felt the baneful effects. When this happens to get into any ſmall wound in the fingers, or if the ſurgeon happens to cut himſelf ſlightly with the diſſecting knife, in opening a putrid body, the conſequences have often been very dangerous, and even rapidly fatal; by reaſon of the putrid ferment being abſorbed into the blood. In this caſe, the ſame remedies muſt be attempted as in the bite of a venomous animal, or where a gangrenous diſpoſition of the juices has been induced from any other cauſe. Whether in this caſe, the application of a ligature, when the ſymptoms begin to appear, could be of any ſervice, may deſerve conſideration; or whether the application of cauſtic, or waſhing the wound well, and enlarging it, that the poiſon might be more perfectly got out, are queſtions worthy of conſideration. Mr. Latta ſuggeſts, that *ſucking* the wound might poſſibly be of uſe, and this, he ſays, might be done by the patient himſelf.

An exiſting ſcratch or wound may alſo be poiſoned, as we have ſaid, by any kind of irritating ſanies. The venereal we have already noticed; and ſome inſtances have happened where a ſurgeon,

having a ſmall wound in his finger, which he did not obſerve, has been infected in the dreſſing or removing a cancerous tumor, and very troubleſome ulcers have enſued, attended with great pain, burning heat, and tenſion over the whole hand and fore arm. This miſchief cannot always be removed, except by the amputation of the arm; nay ſometimes deſtroys the patient altogether. There have been ſeveral melancholy inſtances, as already hinted, where perſons whoſe great abilities have been of the utmoſt conſequence to ſociety, have loſt their lives by wounding themſelves in diſſection, or by having on their hands ſome ſlight ſcratch in the cutis. Such as are employed in diſſecting, ought firſt to waſh their hands in the ſharpeſt vinegar, before they proceed to the operation; and if there is any part of the ſkin broken, however ſmall, the ſmart of the vinegar will make them ſenſible of the neceſſity of guarding that part againſt the poiſon, by the application of ſome adheſive plaſter ſpread on leather.

Union of Simple Wounds.

We have thus far proceeded in treating on SIMPLE WOUNDS, and in the courſe of our remarks have had frequent occaſion to recommend, as the moſt important part of the ſurgeon's buſineſs, the union of wounds by the firſt intention. We propoſe to cloſe the ſubject with ſome of Mr. Hunter's practical obſervations.

"It is with a view to this principal of union," ſays he, "that it has been recommended to bring the ſides (or lips) of wounds together; but as the natural elaſticity of the parts makes them recede, it has been found neceſſary to employ art for that purpoſe. This neceſſity firſt ſuggeſted the practice of ſewing wounds, and afterwards gave riſe to various inventions in order to anſwer this end, ſuch as bandages, ſticking-plaſters, and ligatures. Among theſe, the bandage commonly called the uniting bandage is preferable to all the reſt, where it can be employed; but its application is very confined, from being only adapted to parts where a roller can be uſed. A piece of ſticking-plaſter, which has been called the dry ſuture, is more general in its application than the uniting bandage, and is therefore preferable to it on many occaſions.

"I can hardly ſuppoſe a wound, in any ſituation, where it may not be applied, excepting penetrating wounds, where we wiſh the inner portion of the wound to be cloſed equally with the outer, as in the caſe of hare-lip. But even in ſuch wounds, if the parts are thick, and the wound not large, the ſides will ſeldom recede ſo far as to make any other means neceſſary. The dry ſuture has an advantage over ſtitches, by bringing a larger ſurface of the wound together, by not inflaming the parts to which it is applied, and by neither producing in them ſuppuration nor ulceration, which ſtitches always do. When parts, therefore, can be brought together, and

eſpecially where ſome force is required for that purpoſe, from the ſkin not being in large quantity, the ſticking-plaſter is certainly the beſt application. This happens frequently to be the caſe after removal of tumors, in amputation, or where the ſides of the wound are only to be brought together at one end, as in the hare-lip; and I think the difference between Mr. Sharp's croſs-ſtitch, after amputation, as recommended in his Critical Enquiry, and Mr. Alanſon's practice, ſhews ſtrongly the ſuperiority of the ſticking-plaſter (or dry ſuture). In thoſe parts of the body where the ſkin recedes more than in others, this treatment becomes moſt neceſſary; and as the ſcalp probably recedes as little as any, it is therefore ſeldom neceſſary to apply any thing in wounds of that part; the practice will certainly anſwer beſt in ſuperficial wounds, becauſe the bottom is in thoſe more within its influence.

"The ſticking-plaſters ſhould be laid on in ſtripes, and theſe ſhould be at ſmall diſtances from each other, viz. about a quarter of an inch at moſt, if the part requires cloſe confinement; but when it does not, they may be at greater diſtances. This precaution becomes more neceſſary if the bleeding is not quite ſtopped; there ſhould be paſſages left for the exit of blood, as its accumulation might prevent the union, although this does not always happen. If any extraneous body, ſuch as a ligature, ſhould have been left in the wound, ſuppuration will take place, and the matter ſhould be allowed to vent at ſome of thoſe openings, or ſpaces, between the ſlips of plaſter. I have known a very conſiderable abceſs formed in conſequence of this precaution being neglected, by which the whole of the recently united parts has been ſeparated.

"The interrupted ſuture, which has generally been recommended in large wounds, is ſtill in uſe, but ſeldom proves equal to the intention. This we may reckon to be the only one that deſerves the name of ſuture; it was formerly uſed, but is now in a great meaſure laid aſide in practice, not from the impropriety of uniting parts by this proceſs, but from the ineffectual mode of attempting it. In what manner better methods could be contrived, I have not been able to ſuggeſt. It is to be underſtood that the above methods of bringing wounded parts together, in order to unite, are only to be put in practice in ſuch caſes as will admit of it; for if there was a method known, which in all caſes would bring the wounded ſurfaces into contact, it would in many inſtances be improper, as ſome wounds are attended with contuſion, by which the parts have been more or leſs deadened; in ſuch caſes, as was formerly obſerved, union cannot take place according to our firſt principle, and therefore it is improper to attempt it.

"In many wounds which are not attended with contuſion, when we either know, or ſuſpect, that extraneous bodies have been introduced into the wound, union by the firſt intention ſhould not

be attempted, but they ſhould be allowed to ſuppurate, in order that the extraneous matter may be expelled. Wounds which are attended with laceration, although free from contuſion, cannot always be united by the firſt intention, becauſe it muſt frequently be impoſſible to bring the external parts, or ſkin, ſo much in contact, as to prevent that inflammation which is naturally produced by expoſure. But even in caſes of ſimple laceration, where the external influence is but ſlight, or can be prevented (as we obſerved in treating of the compound ſimple fracture), we find that union by the firſt intention often takes place; the blood which fills up the interſtices of the lacerated parts having prevented the ſtimulus of imperfection in them, and preventing ſuppuration may afterwards be abſorbed.

" Many operations may be ſo performed as to admit of parts uniting by the firſt intention; but the practice ſhould be adopted with great circumſpection: the mode of operating with that view, ſhould in all caſes be a ſecondary, and not a firſt conſideration, which it has unluckily been too often among ſurgeons. In caſes of cancer, it is a moſt dangerous attempt at refinement in ſurgery.

" In the union of wounded parts by the firſt intention, it is hardly or never poſſible to bring them ſo cloſe together at the expoſed edges, as to unite them perfectly by theſe means; ſuch edges are therefore obliged to take another method of healing. If kept moiſt, they will inflame as deep between the cut ſurfaces as the blood fails in the union, and there ſuppurate and granulate; but if the blood is allowed to dry and form a ſcab between, and along the cut edges, then inflammation and ſuppuration of thoſe edges will be prevented, and this will complete the union, as will be deſcribed by and by.

" As thoſe effects of accidental injury, which can be cured by the firſt intention, call up none of the powers of the conſtitution to aſſiſt in the reparation, it is not the leaſt affected or diſturbed by them; the parts are united by the extravaſated blood alone, which was thrown out by the injury, either from the divided veſſels, or in conſequence of inflammation, without a ſingle action taking place, even in the part itſelf, except the cloſing, or inoſculation of the veſſels; for the flowing of the blood is to be conſidered as entirely mechanical. Even in caſes where a ſmall degree of inflammation comes on, it is merely a local action, and ſo inconſiderable, that the conſtitution is not affected by it; becauſe it is an operation to which the powers belonging to the parts themſelves are fully equal. The inflammation may produce a ſmall degree of pain, but the operation of union gives no ſenſation of any kind whatever.

CHAP. II. Of INFLAMMATION and its Consequences.

Inflammation of any part is accompanied with increaſed heat, redneſs, and painful tenſion. For the remote and proximate cauſes of inflammation, together with the treatment of internal inflammatory diſeaſes, ſee Phlegmasiæ in our firſt volume. External inflammation is commonly divided into two ſpecies, the *phlegmonic*, and *erythematic*, or eryſipelatous. Of theſe we ſhall ſpeak in due time, but muſt here dwell a little on what we deem highly important as an introduction to every part of chirurgical practice.

The celebrated doctrines of Mr. Hunter, on inflammation and the properties of the blood, claim our particular attention. In his treatiſe on thoſe ſubjects, after a few paragraphs explanatory of terms, the author proceeds to the *natural hiſtory of the blood*, in which however he certainly has been very fully anticipated by Mr. Hewſon, who had concluded that air has great efficacy in cauſing the blood to coagulate, that cold has none, and reſt but little. As to cold, Mr. Hunter is of the ſame opinion, but he thinks air has no more effect than any other extraneous body in contact with the blood that is capable of making an impreſſion upon it. "Reſt," he obſerves, "has greater influence in the change than any other circumſtance whatever; yet it is not reſt, conſidered ſimply, but reſt under certain circumſtances, which appears to poſſeſs ſuch a power; for motion given to the blood out of the veſſels will not of itſelf prevent its coagulation; nor will it even in the veſſels themſelves, if all the purpoſes of motion are not anſwered by it."

On this part it will not be neceſſary here to go to any great length. After ſome important obſervations, Mr. Hunter thus conciſely delivers his ſentiments: "My opinion is," ſays he, "that the blood coagulates from an impreſſion; that is, its fluidity under ſuch circumſtances being improper or no longer neceſſary, it coagulates to anſwer now the neceſſary purpoſe of ſolidity. This power ſeems to be influenced in a way in ſome degree ſimilar to muſcular action, though probably not entirely of that kind." From theſe expreſſions, we leave the reader to judge how far the author has ſucceeded in his attempt to inveſtigate the cauſe of the coagulation of the blood. We conſider the phraſe *ſtimulus of neceſſity*, to which he reſorts, a phraſe of difficult meaning, to ſay the leaſt; but we may hope that future enquirers will be more ſucceſsful. The queſtion is important to phyſiology; and thoſe who attempt to ſolve it ſhould have in view the late experiments on milk, a fluid which bears no ſmall analogy to blood.

In his idea that the *coagulating lymph* is the moſt eſſential part of the blood, Mr. Hunter coincides with ſome preceding phyſiologiſts

of great celebrity. "Reſt, or ſlow motion of the blood in the veſſels," ſays he, "gives a diſpoſition towards the ſeparation of the red part, as well as when it is extravaſated; ſince the blood in the veins of an animal acquires a diſpoſition to ſeparate its red parts more than in the arteries, eſpecially if it be retarded in the veins: the nearer, therefore, to the heart in the veins, the greater will the diſpoſition for ſeparation be; though it does not ſeem to retard coagulation. This is always obſervable in bleeding; for if we tie up an arm, and do not bleed it immediately, the firſt blood that flows from the orifice, or that which has ſtagnated for ſome time in the veins, will ſooneſt ſeparate into its three conſtituent parts: this circumſtance expoſes more of the coagulating lymph at the top, which is ſuppoſed by the ignorant to indicate more inflammation, while the next quantity taken ſuſpends its red parts in the lymph, and gives the idea that the firſt ſmall quantity had been of ſuch ſervice at the time of its flowing, as to have altered for the better the whole maſs of blood."

The ſections on the ſerum and red globules of the blood contain a variety of facts which may be advantageouſly compared, 1. with the facts related by Mr. Hewſon, and 2. with the later writers on the effect of reſpiration on the blood. The author ſupplies many obſervations from the beſt of all poſſible ſources—the living human body, by which the late well-known doctrines may be corrected and extended. The celebrated theory of the *living principle of the blood* muſt not be paſſed over without notice, though ſomewhat remote from the immediate ſubject of the preſent ſection.

"That the blood has life," ſays Mr. Hunter, "is an opinion I have ſtarted for above thirty years, and have taught it, for near twenty of that time, in my lectures; it does not, therefore, come out at preſent as a new doctrine; but has had time to meet with conſiderable oppoſition, and alſo acquire its advocates. To conceive that blood is endowed with life, while circulating, is perhaps carrying the imagination as far as it well can go; but the difficulty ariſes merely from its being fluid; the mind not being accuſtomed to the idea of a living fluid. It may therefore be obſcure at firſt, and it will be the more neceſſary that I ſhould be pretty full in my account of it; yet the illuſtration of it in my account of inflammation, will perhaps do more to produce conviction than any other attempt, though ſtrongly ſupported by facts. It is to me ſomewhat aſtoniſhing, that this idea did not early ſtrike the medical enquirers, conſidering the ſtreſs which they have laid on the appearances of this fluid in diſeaſes; ſince it is probably more expreſſive of diſeaſe than any other part of the animal economy: and yet all this, according to them, muſt have ariſen from—what ſhall I call it?—a dead animal fluid, on which a diſeaſe in the ſolids muſt have had ſuch an effect. This, I think, is giving too much to the ſolids, and too

little to the fluids. When all the circumſtances attending this fluid are fully conſidered, the idea that it has life within itſelf, may not appear ſo difficult to comprehend; and indeed, when once conceived, I do not ſee how it is poſſible we ſhould think it to be otherwiſe; when we conſider that every part is formed from the blood, that we grow out of it, and if it has not life previous to this operation, it muſt then acquire it in the act of forming; for we all give our aſſent to the exiſtence of life in the parts, when once formed. Our ideas of life have been ſo much connected with organic bodies, and principally thoſe endowed with viſible action, that it requires a new bend to the mind, to make it conceive that theſe circumſtances are not inſeparable. It is within theſe fifty years only, that the callus of bones has been allowed to be alive*; but I ſhall endeavour to ſhow, that organization and life do not depend in the leaſt on each other; that organization may ariſe out of living parts, and produce action, but that life can never riſe out of, or depend on, organization. An organ is a peculiar conformation of matter (let that matter be what it may), to anſwer ſome purpoſe, the operation of which is mechanical; but, mere organization can do nothing: even in mechanics it muſt have ſomething correſponding to a living principle; namely, ſome power. I had long ſuſpected that the principle of life was not wholly confined to animals, or animal ſubſtances endowed with viſible organization and ſpontaneous motion: I conceived that the ſame principle exiſted in animal ſubſtances devoid of apparent organization and motion, where there exiſted ſimply the power of preſervation.

"I was led to this notion about the years 1755, or 56, when I was making drawings of the growth of the chick, in the proceſs of incubation. I then obſerved, that whenever an egg was hatched, the yolk (which is not diminiſhed in the time of incubation) was always perfectly ſweet to the very laſt; and that part of the albumen, which is not expended on the growth of the animal, ſome days before hatching, was alſo ſweet, although both were kept in a heat of 103° in the hen's egg for three weeks, and in the duck's for four. I obſerved, however, that if an egg did not hatch, it became putrid in nearly the ſame time with any other dead animal matter; an egg, therefore, muſt have the power of ſelf-preſervation, or, in other words, the ſimple principle of life. To determine how far eggs would ſtand other teſts, to prove a living principle, I made the following experiments†:

"Having put a new-laid egg into a cold about 0, which froze

* Dr. Hunter was the firſt who ſhowed callus to be endowed with the principle of life, as much as bone.

† Philoſ. Tranſact. vol. XLVIII. part i. page 28, 9; as alſo Mr. Hunter's Obſervations on certain Parts of the Animal Economy, page 106, firſt edition.

it, I then allowed it to thaw; from this proceſs I imagined that the preſerving powers of the egg might be deſtroyed *.

" I next put this egg into the cold mixture, and with it one newly laid; the difference in freezing was ſeven minutes and a half; the freſh egg taking ſo much longer time in freezing.

" A new-laid egg was put into a cold atmoſphere, fluctuating between 17° and 15°; it took above half an hour to freeze; but when thawed, and put into an atmoſphere at 25°, viz. nine degrees warmer, it froze in half the time: this experiment was repeated ſeveral times with nearly the ſame reſult.

" To determine the comparative heat between a living and a dead egg, and alſo to determine whether a living egg be ſubject to the ſame laws with the more imperfect animals, I made the following experiments: a freſh egg, and one which had been frozen and thawed, were put into the cold mixture at 15°; the thawed one ſoon came down to 32° and began to ſwell and congeal; the freſh one ſunk firſt to 29° and a half, and in twenty-five minutes after the dead one, it roſe to 32°, and began to ſwell and freeze. The reſult of this experiment upon the freſh egg, was ſimilar to what was obſerved in the like experiments upon frogs, eels, ſnails, &c. where life allowed the heat to be diminiſhed two or three degrees below the freezing point, and then reſiſted all further decreaſe; but in both, the powers of life were expended by this exertion, and then the parts froze like any other dead animal matter.

" This is not a principle peculiar to life, but is common in many other caſes: it has been obſerved that water could be ſo circumſtanced as to be brought below the freezing point without freezing; but juſt as it began to freeze, it roſe to 32°. In my experiments on the heat of vegetables, I obſerved that the ſap of a tree would freeze at 32°, when taken out of the veſſels of the tree; but I found the tree often ſo low as 15°, and the ſap not frozen.

" From theſe experiments, it appears that a freſh egg has the power of reſiſting heat, cold, and putrefaction, in a degree equal to many of the more imperfect animals, which exhibit exactly the ſame phenomena under the ſame experiments; and it is more than probable that this power ariſes from the ſame principle in both. Similar experiments have been made on the blood: after a portion of blood had been frozen, and then thawed, it has again been frozen with a ſimilar quantity of freſh blood, drawn from the ſame per-

* However, this was at firſt not ſo certain; but the reſult of the experiment proved it was ſo. To be more certain of killing a part by freezing, it ſhould be frozen *very ſlowly*, for ſimple freezing does not kill.

ſon, and that which had undergone this proceſs froze again much faſter than the freſh blood*."

As all theſe experiments made by Mr. Hunter upon the freezing of animals, with a view to ſee whether it was poſſible to reſtore the actions of life when they were again thawed, were made upon whole animals; and as he never ſaw life return by *thawing*, he endeavoured next to aſcertain how far parts were, in this reſpect, ſimilar to the whole; eſpecially ſince it was aſſerted, and with ſome authority, that parts of a man may be frozen and may afterwards recover. For this purpoſe he made ſeveral experiments upon animals, of the ſame order with the human ſubject. The reſult of theſe will appear in our ſubſequent extracts.

The following experiments were made in the ſame manner, on living muſcles, to ſee how far the contractions of living muſcles, after having been frozen, correſpond with the coagulation of the blood.

"A muſcle, removed from a frog's leg, with a portion of its tendon, was immediately placed between two pieces of lead, and expoſed to a cold about ten degrees below 0. In five minutes it was taken out, when it was quite hard and white; on being gradually thawed, it became ſhorter, and thicker, than while frozen; but on being irritated did not contract; yet if at all elongated by force, it contracted again, and the tendinous expanſion covering the muſcle was thrown into wrinkles: when the ſtimulus of death took place, it became ſtill ſhorter.

"From a ſtraight muſcle in a bullock's neck, a portion, three inches in length, was taken out immediately after the animal had been knocked down, and was expoſed between two pieces of lead, to a cold below 0, for fourteen minutes; at the end of this time it was found to be frozen exceedingly hard, was become white, and was now only two inches long: it was thawed gradually, and in about ſix hours after thawing, it contracted ſo as only to meaſure one inch in length; but irritation did not produce any ſenſible motion in the fibres. Here then were the juices of muſcles frozen, ſo as to prevent all power of contraction in their fibres, without deſtroying their life; for when thawed, they ſhowed the ſame life which they had before: this is exactly ſimilar to the freezing of blood too faſt for its coagulation; which, when thawed, does afterwards coagulate, as it depends in each on the life of the part not being deſtroyed. I took notice in the hiſtory of the coagulation of the lymph, that heat of 120 degrees excited this action in that fluid: to ſee how far muſcular contraction was ſimilar in this reſpect, I made the following experiment†:

* Vide Corrie's work on the Virality of the Blood, page 44.

† Vide Philoſ. Tranſ. vol. LXV. page 412. Paper on Drowning; alſo, Obſervations on certain Parts of the Animal Economy, by Mr. Hunter.

" As ſoon as the ſkin could be removed from a ſheep that was newly killed, a ſquare piece of muſcle was cut off, which was afterwards divided into three pieces, in the direction of the fibres: each piece was put into a baſon of water; the water in each baſon being of different temperatures, viz. one 125°, about 27 degrees warmer than the animal; another 98°, the heat of the animal; and the third 55°, about 43 degrees colder than the animal. The muſcle in the water heated to 125°, contracted directly, ſo as to be half an inch ſhorter than the other two, and was hard and ſtiff. The muſcle in the water heated to 98°, after ſix minutes, began to contract and grow ſtiff: at the end of twenty minutes it was nearly, though not quite, as ſhort and as hard as the above. The muſcle in the water heated to 55°, after fifteen minutes, began to ſhorten and grow hard: after twenty minutes it was nearly as ſhort and as hard, as that in the water heated to 98°. At the end of twenty-four hours, they were all found to be of the ſame length and ſtiffneſs.

" Here is alſo a ſimilarity in the excitements of coagulation in the blood, and of contraction in muſcles, both apparently depending on the ſame principle, namely, their *life*.

" If it ſhould ſtill be difficult to conceive how a body in a fluid ſtate, whoſe parts are in conſtant motion upon one another, always ſhifting their ſituation with reſpect to themſelves and the body, and which may loſe a portion without affecting itſelf or the body, can poſſibly be alive; let us ſee if it is alſo difficult to conceive that a body may be ſo compounded, as to make a perfect whole of itſelf, having no parts diſſimilar, and having the ſame properties in a ſmall quantity, as in a great. Under thoſe circumſtances, the removing a portion is not taking away the conſtituent part, upon which the whole depends, or by which it is made a whole, but is only taking away a portion of the whole; the remaining portion being equal in quality to the whole, and in this reſpect is ſimilar to the reducing a whole of any thing. This might be perfectly illuſtrated without ſtraining the imagination, by conſidering the operation of union by the firſt intention. Union, by the firſt intention, is an immediate ſympathetic harmony between divided parts, when brought ſimply into contact, which I call contiguous ſympathy. In this caſe, it is not neceſſary that the very ſame parts ſhould oppoſe each other, elſe harmony, and conſequently union, could never take place; it is ſimply neceſſary that the two parts be alive, and they might be ſhifted from one ſort of living creature to another for ever, without any injury to either, or without exciting irritation; and the whole would ſtill be as perfect as ever. Neither can the motion of one living part upon another affect the body, becauſe all its parts are ſimilar, and in harmony with each other. It is exactly the ſame with the blood, for neither its motion on it-

ſelf, nor its motion on the body, can either affect it or the body, ſince all the parts are ſimilar among themſelves. This is the caſe with all matter, where the property does not depend upon ſtructure or configuration, but upon the compound; for water is ſtill water, whether its parts are moving on each other, or at reſt: and a ſmall portion has the ſame property with the whole, and is in fact a ſmaller whole. One of the great proofs that the blood poſſeſſes life, depends on the circumſtances affecting its coagulation; and, at preſent, we are only to explain the principles upon which theſe are founded, which it will be in ſome degree neceſſary to recapitulate; but, perhaps, the ſtrongeſt conviction on the mind will ariſe from the application of this principle to diſeaſes, eſpecially inflammation. While the blood is circulating, it is ſubject to certain laws to which it is not ſubject when not circulating. It has the power of preſerving its fluidity, which was taken notice of when treating of its coagulation; or, in other words, the living principle in the body has the power of preſerving it in this ſtate. This is not produced by motion alone, for in the colder animals, when almoſt in a ſtate of death during the winter, when their blood is moving with extreme ſlowneſs, and would appear to preſerve ſimply animal life through the whole body, and keep up that dependence which exiſts between the blood, and the body already formed, the blood does not coagulate to accompliſh theſe purpoſes. If the blood had not the living principle, it would be, in reſpect of the body, as an extraneous ſubſtance. Blood is not only alive itſelf, but is the ſupport of life in every part of the body; for mortification immediately follows, when the circulation is cut off from any part, which is no more than death taking place in the part, from the want of the ſucceſſive changes of freſh blood. This ſhows, that no part of the body is to be conſidered as a complete living ſubſtance, producing and continuing mere life, without the blood: ſo that blood makes one part of the compound; without which life would neither begin nor be continued. This circumſtance, on its firſt appearance would ſeem a little extraordinary, when we conſider that a part, or the whole, are completely formed in themſelves, and have their nerves going to them, which are ſuppoſed to give animal life; yet that perfect living part, or whole, ſhall die in a little time, by ſimply preventing the blood from moving through the veſſels: under this idea, it is not clear to me, whether the blood dies ſooner without the body, or the body without the blood. Life then is preſerved by the compound of the two, and an animal is not perfect without the blood: but this alone is not ſufficient, for the blood itſelf muſt be kept alive; becauſe, while it is ſupporting life in the ſolids, it is either loſing its own, or is rendered incapable of ſupporting that of the body. To accompliſh all this it muſt have motion, and that in a circle, as it is a continuance of the ſame

blood which circulates, in which circle it is in one view ſuperſaturated, as it were, with living powers, and in another is deficient, having parted with them while it viſited the different parts of the body. Life is, in ſome degree, in proportion to this motion, either ſtronger, or weaker; ſo that the blood may be reckoned, in ſome degree, a firſt moving power; and not only is the blood alive in itſelf, but ſeems to carry life every-where; however, it is not ſimply the motion, but it is that which ariſes out of, or in conſequence of, the motion. Here then would appear to be three parts, viz. body, blood, and motion; which latter preſerves the living union between the other two, or the life in both. Theſe three make up a complete body, out of which ariſes a principle of ſelf-motion; a motion totally ſpent upon the machine, or which may be ſaid to move in a circle for the ſupport of the whole: for the body dies without the motion of the blood upon it; and the blood dies without the motion of the body upon it; perhaps pretty nearly in equal times.

"So far, I have conſidered the blood when compounded with the body and motion, in which we find it preſerves its fluidity, and continues life in the body; but fluidity is only neceſſary for its motion to convey life, and the continuance of life is, probably, owing its being coagulated, and becoming a ſolid; or, at leaſt, the ſupport of the body is owing to this cauſe. For this, however, it requires reſt, either by extravaſation, or by being retained in the veſſels till the utility of circulating is loſt; or till it can anſwer ſome good purpoſe by its coagulation, as in mortification. Under any of theſe circumſtances it becomes a ſolid body; for the moment it is at reſt, it begins to form itſelf into a ſolid, and changes into this or that particular kind of ſubſtance, according to the ſtimulus of the ſurrounding parts which excites this coagulum to action, and makes it form within itſelf, blood, veſſels, nerves, &c.

"The coagulation is the firſt ſtep towards its utility in the conſtitution, and this ariſes from its living principle; for if that principle be deſtroyed, it does not coagulate at all, that is naturally; for I do not here ſpeak of any chemical coagulation."

The ingenious author next endeavours to prove "that the coagulation of the coagulating lymph bears ſome analogy to the actions of muſcles, which we know to depend upon life;" and which, he ſays, affords one of the ſtrongeſt proofs of the exiſtence of this principle. For though the action of coagulation itſelf be not ſimilar to the actions of muſcles; yet, from their being governed by the ſame laws, he with ſufficient reaſon concludes, that the firſt principle is the ſame in both.

As the coagulation of the blood appears to be that proceſs which may be compared with the action of life in the ſolids, he examines this property a little further, to ſee if this power of coagulation can

be deſtroyed; and if ſo, whether, by the ſame means, life is deſtroyed in the ſolids; the phænomena being nearly the ſame in both.

"Animals killed by lightning, and alſo by electricity, have not their muſcles contracted: this ariſes from death being inſtantaneouſly produced in the muſcles, which therefore cannot be affected by any ſtimulus, nor conſequently by the ſtimulus of death. In ſuch caſes the blood does not coagulate. Animals who are run very hard, and killed in ſuch a ſtate, or what produces ſtill a greater effect, are run to death, have neither their muſcles contracted, nor their blood coagulated; and in both reſpects the effect is in proportion to the cauſe. This is the reaſon why hunted animals are commonly more tender than thoſe that are ſhot.

"In many kinds of death, we find that the muſcles neither contract, nor does the blood coagulate. In ſome caſes the muſcles will contract while the blood continues fluid; in ſome the contrary happens; and in others the blood will only coagulate to the conſiſtence of cream.

"Blows on the ſtomach kill immediately, and the muſcles do not contract, nor does the blood coagulate. Such deaths as prevent the contraction of the muſcles, or the coagulation of the blood, are, I believe, always ſudden. Death from ſudden guſts of paſſion is of this kind; and in all theſe caſes the body ſoon putrifies after death. In many diſeaſes, if accurately attended to, we find this correſpondence between muſcles and blood; for where there is ſtrong action going on, the muſcles contract ſtrongly after death, and the blood coagulates ſtrongly."

The proper deduction from all theſe facts, Mr. Hunter thinks is perfectly eaſy.

"This *living principle in the blood*," ſays he, "which I have endeavoured to ſhow to be ſimilar in its effects to the living principle in the ſolids, owes its exiſtence to the ſame matter which belongs to the other, and is the materia vitæ diffuſa, of which every part of an animal has its portion *: it is, as it were, diffuſed through the whole ſolids and fluids, making a neceſſary conſtituent part of them, and forming with them a perfect whole; giving to both the power of preſervation, the ſuſceptibility of impreſſion; and, from their conſtruction, giving them conſequent reciprocal action. This is the matter which principally compoſes the brain; and where there is a brain, there muſt neceſſarily be parts to connect it with the reſt of the body, which are the nerves; and as the uſe of the nerves is to continue, and therefore convey the impreſſion or action of the one

* Mr. Hunter ſuppoſes that ſomething ſimilar to the materials of the brain is diffuſed through the body, and even contained in the blood; between this and the brain a communication is kept up by the nerves. He therefore adopts terms explanatory of this theory; calling the brain, the *materia vitæ conſervata*; the nerves, the *chordæ internunciæ*; and that diffuſed through the body, the *materia vitæ diffuſa*.

to the other, these parts of communication must necessarily be of the same matter; for any other matter could not continue the same action.

"From this it may be understood, that nothing material is conveyed from the brain, by the nerves; nor vice versa, from the body to the brain: for if that was exactly the case, it would not be necessary for the nerves to be of the same materials with the brain; but as we find the nerves of the same materials, it is a presumptive proof, that they only continue the same action which they receive at either end.

"The blood has as much the materia vitæ as the solids, which keeps up that harmony between them; and as every part endued with this principle has a sympathetic affection upon simple contact, so as to affect each other (which I have called contiguous sympathy), so the blood, and the body, are capable of affecting, and being affected, by each other; which accounts for that reciprocal influence which each has on the other. The blood being evidently composed of the same materials with the body, being endued with the same living powers, but, from its unsettled state, having no communication with the brain, is one of the strongest proofs of the materia vitæ making part of the composition of the body, independent of the nerves; and is similar, in this respect, to those inferior orders of animals that have no nerves, where every other principle of the animal is diffused through the whole. This opinion cannot be proved by experiment; but I think daily experience shows us, that the living principle in the body acts exactly upon the same principle with the brain. Every part of the body is susceptible of impression; and the materia vitæ, of every part, is thrown into action; which, if continued to the brain, produces sensation; but it may only be such as to throw the part of impression into such actions as it is capable of, according to the kind of impression; so does the brain or mind. The body loses impression by habit; so does the brain: it continues action from habit; so does the brain. The body, or parts of the body, have a recollection of former impressions, when impressed anew; so has the brain; but they have not spontaneous memory as the brain has, because the brain is a complete whole of itself, and therefore its actions are complete in themselves. The materia vitæ of the body being diffused, makes part of the body in which it exists and acts for this part, probably for this part alone. The whole, taken together, hardly makes a whole, so as to constitute what might be called an organ; the action of which is always for some other purpose than itself: but this is not the case with the brain. The brain is a mass of this matter, not diffused through any thing, for the purpose of that thing, but constituting an organ in itself, the actions of which are for other purposes, viz. receiving,

by means of the nerves, the vaſt variety of actions in the diffuſed materia vitæ, which ariſe from impreſſion and habit, combining theſe and diſtinguiſhing from what part they come. The whole of theſe actions form the mind; and, according to the reſult, impreſs more or leſs of the materia vitæ of the body in return, producing in ſuch parts conſequent actions. The brain then depends upon the body for its impreſſion, which is ſenſation; and the conſequent action is that of the mind: and the body depends upon the conſequence of this intelligence, or effect of this mind, called the will, to impreſs it to action; but ſuch are not ſpent upon itſelf, but are for other purpoſes, and are called voluntary.

"But mere compoſition of matter does not give life; for the dead body has all the compoſition it ever had: life is a property we do not underſtand: we can only ſee the neceſſary leading ſteps towards it."

Amongſt the unconnected experiments on the human blood, we have the following very ſtriking ones.

In order to diſcover whether the diſpoſition of the blood to putrify was greater in old than in young perſons, ſome blood was drawn from a woman twenty years of age. The ſurface of this, after coagulation, was covered with an inflammatory cruſt. Some blood was taken from a woman, aged ſixty, when the craſſamentum was alſo covered with an inflammatory cruſt.

"The blood from the old woman putrified in two days. That from the young woman kept quite ſweet till the fifth day, when it began to ſmell diſagreeably; in this ſtate it continued two days more, and then emitted the common odour of putrid blood.

"Several experiments were made in the courſe of the ſummer, of a ſimilar nature with the laſt, in all which it appeared that the blood from the young people kept longer ſweet than that which was taken from the old.

"In October, 1790, when the weather was cold, ſome blood was taken from two men, one of whom was ſeventy-five years of age, and the other eighty-three, about ſix ounces from each. The blood in each kept ſweet till the fifth day; but, on the ſixth, both quantities ſmelt equally putrid, which uniformity accords with the above experiment."

In order to ſee if recent blood or coagulated blood loſt their heat ſooneſt:

"Four ounces of blood, after coagulation, was heated till it raiſed the mercury of a thermometer, placed in the middle of the coagulum, to the 98th degree. The thermometer was put into a ſimilar quantity of blood, immediately after it was taken from the vein, and the mercury ſtood at 90°. Theſe were placed by each other, and the thermometer put alternately into each, to obſerve how they parted with their heat.

Coagulated blood	98°
Ditto, after two minutes	97°
Ditto, after four minutes more	93°
Ditto, after two ditto more	92°
Ditto, after two ditto more	91°
Recent blood	90°
Ditto, after two minutes	89°
Ditto, after four minutes more	88°
Ditto, after two ditto more coagulated	87°
Ditto, after two ditto more	86°

" This experiment was not accurately made, for the two bloods ſhould have been of the ſame temperature, becauſe the warmer any body is, the faſter it will loſe its heat to any neighbouring colder body;" yet Mr. Hunter believes that the coagulated blood loſt its heat faſter than the fluid blood.

Of extraneous matter in the blood, Mr. Hunter remarks, that

" Whatever is diſſolved in the blood muſt be only diffuſed through it, not chemically combined with it, otherwiſe the nature of the blood itſelf would be altered, and the effect of medicine deſtroyed. The blood can receive and retain extraneous matter, capable of deſtroying the ſolids, by ſtimulating to action ſo as to deſtroy them.

" Extraneous matter in the blood is capable of altering the chemical properties of the ſolids in thoſe who work in lead, as is evident in the following caſe:

" Morgan, a houſe-painter, who had been paralytic in his hands and legs for a conſiderable time, was thrown down, and had his thigh-bone broken juſt below the little trochanter. The upper end of the inferior portion had paſſed over the outſide of the other, and moved with the knee, ſo that the end of the lower bone was taken for the great trochanter; but I diſcovered the fracture by extending the leg, and got the portions of bone in their places, and bound up the limb with a roller. It went on well for near a fortnight, only his hands ſwelling at times, which gave way to fomentations; in the third week, he grew very ill, became low, had a kind of lethargy, a great deal of blood came out of his mouth, he ſunk ſtill lower, and died about three weeks after the accident.

" On examining the body after death, the muſcles, particularly thoſe of the arms, had loſt their natural colour; but inſtead of being ligamentous and ſemitranſparent, as happens in common paralyſis, they were opaque, reſembling exactly, in appearance, parts ſteeped in a ſolution of Goulard's extract. From this caſe it appears the lead had been evidently carried along with the blood, even into the muſcles themſelves.

We next find Mr. Hunter employed in a diſquiſition concerning the powers of the vaſcular ſyſtem. He endeavours to ſhew that there

is in veſſels a power of muſcular contraction, and that elaſticity is, beſides, neceſſary to their function. His preliminary remarks, though not free from obſcurity, nor, perhaps, a little confuſion in the arrangement of his ideas, are highly worthy of attention. The ſecond circumſtance, indeed, depends on the enunciation of propoſitions without the particular facts on which they reſt.

"Muſcular contraction," the author obſerves, "has been generally ſuppoſed to ariſe from ſome impreſſion, which is commonly called, a ſtimulus; I doubt, however;" ſays he, "of an impreſſion being always neceſſary; and I believe that in many caſes the ceſſation of an accuſtomed impulſe may become the cauſe of contraction in a muſcle. The ſphincter iridis of the eye contracts when there is too much light; but the radii contract when there is little or no light. I can even conceive that a ceſſation of action requires its ſtimulus to produce it, which may be called, the ſtimulus of ceſſation."

It has been judiciouſly obſerved, however, by the reviewers of Mr. Hunter's work, that before the point can be determined, it will be neceſſary to take into account the tranſition of *automatic* into *voluntary* motions, and the power of habit. We think with them, that "the dependency or independency of contraction on irritation, or impreſſion, can only be clearly underſtood by tracing the motions of any muſcle *ab origine*."

In the ſubſequent part of this chapter, many of thoſe queſtions which occur in elementary treatiſes of phyſiology concerning the capacity and power of the heart, and the ſtructure and function of the vaſcular ſyſtem, are very elaborately diſcuſſed; but much too copiouſly for extraction. We ſhall however ſelect ſuch parts as are moſt immediately intereſting.

"The mixed kind of contraction," ſays Mr. Hunter, "is moſt to our preſent purpoſe, and is of two kinds, though it has been in general ſuppoſed to be of one kind only, and that belonging ſolely to the muſcles of reſpiration, as being in them the moſt conſpicuous. But, in fact, we find another mode of involuntary actions in other muſcles of the body, where it anſwers very uſeful purpoſes. In theſe the involuntary contraction may be reckoned the natural ſtate; and it is a kind of permanent contraction, theſe muſcles only relaxing occaſionally, by which means parts are ſuſtained or ſupported: the voluntary contraction of ſuch muſcles is alſo only occaſional. All ſphincter muſcles in ſome degree partake of this power, and therefore ſhould be called muſcles with power of occaſional relaxation. For although many circular muſcles may not have theſe mixed contractions, as the orbicularis palpebrarum; yet that muſcle has a diſpoſition to contract peculiar to itſelf. Its relaxation is to be reckoned of the active kind, which may be called the relaxation of watchfulneſs, and it is when tired of this ſpecies of action that it contracts; which, on the contrary, may be called, the

contraction of ſleep: or it may be conſidered as an elongator muſcle to the levator palpebræ, with a diſpoſition to remain relaxed while that muſcle is contracted; but contracting when the elevator is tired. The natural contraction of the orbicularis muſcle is involuntary; the relaxation, both natural and occaſional, is involuntary; but it has likewiſe a voluntary contraction and relaxation, which can be made to exceed the involuntary, reſembling what is inherent in all the ſphincters.

"Sphincter muſcles, as thoſe of the anus and urethra, and probably the expulſatores ſeminis, and crura of the diaphragm, have both a voluntary and involuntary contraction. In the ſphincters of the anus and urethra this is evident; and the involuntary contraction in theſe muſcles I have called ſphinctoric. The ſphincter ani poſſeſſes it to a degree juſt ſufficient to reſiſt the preſſure of the air and fæces, while the parts above are inactive, preventing the eſcape of theſe, till they give the ſtimulus for expulſion, and then an involuntary relaxation naturally takes place, ſimilar to what happens in muſcular canals.

"The ſphinctoric contraction reſembles, in its effects, that produced by elaſtic ligaments in other parts of the body, which action may be called contractile elaſticity, as bringing back the parts to a certain neceſſary ſtate and retaining them there. But elaſticity would not here have anſwered all the purpoſes, ſince, as it has no relaxing power, more force would have been required to overcome its reſiſtance in the expulſion of the fæces than the gut above could have been able to exert. But the ſuſtaining power being muſcular contraction, a relaxation or ceſſation of that contraction during the time of expulſion, leaves nothing for the fæces to do; but, by means of the action above, ſimply to dilate the relaxed parts. There is likewiſe in theſe muſcles a ſtill further power of contraction, which is produced by the will, and for the purpoſe of giving on particular occaſions greater force than what is commonly neceſſary. The voluntary action of theſe muſcles is, therefore, we find more powerful than the involuntary; but upon the whole I think we have reaſon to ſuppoſe, that the involuntary muſcles are much ſtronger than the voluntary. Can we believe that ſo thin a muſcle as the colon of a horſe could ſqueeze out its contents, conſiſting of a column of dung about eight inches diameter, if thoſe involuntary muſcles had no more ſtrength than the muſcles of an extremity? When we ſee the bladder of urine throwing out its contents, through a large tube, to a diſtance perhaps two yards beyond its extreme end, we muſt ſuppoſe a much greater force exerted than could belong to any ſuch quantity of voluntary muſcle. For I believe that by graſping the bladder with both hands we could not make the water flow out to an equal diſtance. It may be here obſerved, that the power of involuntary contraction commonly remains longer than that of the voluntary, though I believe not in all inſtances: which

difference produces a greater variety in the former than in the latter. Thus the muſcular action of the arteries is longer retained than that of the heart.

" Elaſticity is a property of matter (whether animal or not) which renders it capable of reſtoring itſelf to its natural poſition, after having been acted upon by ſome mechanical power, but having no power of action ariſing out of itſelf; this is exactly the reverſe of muſcular contraction. Muſcles, as has been already obſerved, have the power of contraction and of ceſſation, which laſt is called relaxation; but not the power of elongation, which would be an act of reſtoration, ſuch as exiſts in elaſticity. A muſcle, therefore, has the power of action within itſelf, by which it produces its effects, but is obliged to other powers for its reſtoration, ſo as to be able to act again; whereas elaſticity is obliged to other powers to alter the poſition of the parts, ſo as to require recovery or reſtoration; but this it is capable of doing itſelf, and by this power it produces its effects, becoming a cauſe of motion in other bodies. A body poſſeſſed of this property, when brought from the ſtate of reſt, is always endeavouring to arrive at this ſtate, which it alſo endeavours to preſerve, and it is capable of ſupporting itſelf in this ſtate in proportion to the degree of elaſticity which may belong to it.

" The action of elaſticity is continual, and its immediate effects are produced whenever the reſiſtance is removed; by which it may be diſtinguiſhed from other powers. Elaſtic matter can either be extended beyond its ſtate of reſt, or brought within it. Thus a ſpring being bent, its concave ſide is brought within this ſtate, and the convex ſide is carried beyond it: when under theſe circumſtances it is left to itſelf, both ſides endeavour to reſtore themſelves. The power of an elaſtic body is permanent, always acting with a force proportioned to the power applied, and therefore re-acts as the body is elongated, bent, or compreſſed; but this is very different from the action of a muſcle, as this laſt may act with its full force, or only in part, or not at all, according to circumſtances. Elaſticity, which has the power of reſiſting the action of other parts, as well as of reſtoring the ſubſtance endowed with it, when forcibly removed from a ſtate of reſt, is introduced into an animal body, in order to co-operate in many reſpects with the muſcles, and ſo to act as to reſtore or fit them for a new action, becoming in many caſes antagoniſts to the muſcles, which will be deſcribed when we ſpeak of the combination of the two."

The ſubject of *union by the firſt intention*, ſeems to be the link which connects the foregoing diſquiſitions, on the nature and properties of *the blood*, with the *doctrine of* INFLAMMATION, which we have principally in view.

" The operations of reſtoration," Mr. Hunter obſerves, " ariſe naturally out of the accident itſelf; for when there is only a mecha-

nical alteration in the ſtructure, the ſtimulus of imperfection taking place, immediately calls forth the action of reſtoration; but this is contrary to what happens in diſeaſe; for diſeaſe is a diſpoſition producing a wrong action, and it muſt continue this wrong action till the diſpoſition is ſtopped, or wears itſelf out; when this ſalutary effect, however, has once taken place, the ſtate of the body becomes ſimilar to that in a ſimple accident, viz. a conſciouſneſs of imperfection is excited, which produces the action of reſtoration."

The author, having illuſtrated his doctrine by the recital of ſome caſes of the ſpontaneous removal of *ecchymoſis*, obſerves, that, "The *union by the firſt intention* uſually takes place ſo ſoon after the injury, that it may be ſaid to be almoſt immediate; for when the blood has coagulated in ſuch a ſituation as to adhere to both ſurfaces, and ſo as to keep them together, it may be ſaid that the union is begun. It is not, however, immediately ſecure from mechanical violence, and the blood itſelf by loſing its power of retaining life, may likewiſe be rendered unfit to preſerve the communication with the adheſing ſurface (by which it is connected with the body at large), and thus the union be of courſe prevented. If there be no ſuch impediment, then the union of the parts may be very quick; but it will be in ſome degree according to the quantity of extravaſated blood interpoſed; for if that be large, the whole blood will not become vaſcular, but the ſurface only which is in contact with ſurrounding parts, and the reſt will be abſorbed as in the ecchymoſis. Where the quantity is ſmall, as in a ſlight wound without laceration, and where all the divided ſurfaces can be brought into almoſt abſolute contact, their union will be firm in twenty-four hours, as happens in a hare-lip, or wounds of the ſcalp.

"Although under ſuch circumſtances the blood ſeems to change into a ſolid form very quickly, yet when the ſituation of the wound particularly ſubjects the parts to mechanical violence, we ſhould not truſt to this union being completed in ſo ſhort a time.

"In the hare-lip, for inſtance, perhaps forty-eight hours may be required to make it perfectly ſecure, and except when the ſtitches by producing ulceration might make ſcars, there can be no harm in allowing ſuch parts even a longer time for their union. But in wounds of the ſcalp, this caution is not neceſſary; and indeed in ſuch caſes it is ſcarcely required to make ſtitches at all.

"In caſes of accidental injury, whether they be in themſelves ſlight or conſiderable, in whatever ſituation or part they may have happened, if the ſalutary proceſſes above deſcribed go on readily, no other effect of injury, or irritation, or pain, in conſequence of nature's operations is felt. No univerſal ſympathy or fever takes place, except what ariſes from the mere injury done, but all is quiet as if nothing had happened. This is ſometimes the caſe even in a ſimple fracture of the bones of the leg, in fiſſures of the ſcull, &c. However, the magnitude of the accident often produces effects

which are alarming, and more particularly when they happen to parts eſſential to life. Theſe effects are often the cauſe of much danger, the conſtitution becoming affected according to the nature and importance of the parts injured. Thus concuſſion and extravaſation affecting the brain, muſt likewiſe affect the conſtitution, from its natural action and influence on the body being diminiſhed, increaſed, or otherwiſe diſturbed. The ſame thing happens from an injury done to any other vital part of the body, and the effects will be according to the uſe of ſuch parts, or the influence which they have on the ſyſtem.

"However, theſe immediate and ſalutary operations do not always take place ſimply, for they are often altered by other circumſtances; as the accident ſometimes becomes the cauſe of irritation, and produces another operation of the parts, called *inflammation*, which is often of ſingular ſervice, by increaſing the power of union in the broken parts.

"This inflammation will generally be in proportion to the degree of injury done, the nature of the parts injured, and the ſtate of the conſtitution at the time, which, in other words, is in proportion to what is requiſite for the firſt powers of union. But it ſometimes happens that inflammation goes further than is required, and produces a variety of actions ſucceeding each other in regular progreſſion. This may occaſionally be obſerved in certain ſimple fractures, in which the extravaſated blood, acting as an extraneous body, becomes the cauſe of the ſuppurative inflammation; and the ſimple is in this way brought to a ſtate reſembling the compound fracture. The inflammation, however, does not extend over all the lacerated parts, as when they are expoſed at the time of the injury, many of theſe having united by the firſt intention."

Another diviſion of injury ariſing from accident, Mr. Hunter deſcribes to be that where the ruptured parts *communicate externally*, producing effects different from the former. Theſe he divides into two kinds, viz. wounds made by a ſharp cutting inſtrument, and contuſions producing death in the parts injured.

"A wound is a breach made in the continuity of the ſolids of a part, beginning moſt commonly on the external ſurface, and proceeding inwards; although ſometimes its direction is from the inſide outwards, as in compound fractures. A gun-ſhot wound may be ſaid to partake of both circumſtances, as it paſſes through a part: wounds often admit of the ſame mode of cure with accidents which do not communicate externally, but then it requires the art of the ſurgeon to place them in the ſame ſituation, or under the ſame circumſtances.

"A wound is either ſimple or compound: the ſimple is what I have now to explain, and is of ſuch a nature as to admit of union by the firſt intention. For this purpoſe, art muſt be employed by the ſurgeon to bring the ſeparated ſurfaces in contact; that by

retaining them there till the union ſhall have taken place, the injury may be removed from the ſtate of an expoſed wound.

" This treatment of freſh wounds with a view to cure them by the firſt intention, is equally proper after many operations, as in accidental injuries. Inſtances of this often occur after diſſecting out tumors, ſcalping when no fracture is found, and when trepanning has not been performed; and it has been put in practice even where the trepan has been applied. It has been employed alſo after amputations; in ſhort, wherever a clean cut wound is made in ſound parts, and when the ſurfaces can be brought into contact, or where there is ſufficient ſkin to cover the part, this practice may, and ſhould be followed.

" In no caſe, however, of a breach of continuity, can we entirely prevent the parts from retaining the appearance of a wound, for the breach in the ſkin will more or leſs remain, and the blood will coagulate, become dry, and form a ſcab. But this operation of nature reduces the injury to the ſtate of a mere ſuperficial wound, and the blood which is continued from the ſcab to the more deeply ſeated parts, retaining its living principle, juſt as the natural parts do at the bottom of a ſuperficial wound, the ſkin is formed under this ſcab in the one caſe as in the other; yet if the ſcab ſhould either irritate, or a part underneath loſe its uniting powers, then inflammation, and even ſometimes ſuppuration, may be produced. It is often, however, only inflammation that is produced; the ſcab here preventing the further progreſs of miſchief in the ſame manner as the ſcabbing of the pus on a ſore prevents the proceſs of ſuppuration, which becomes one of the uſes of pus.

" In many of the caſes in which we mean to produce union by the firſt intention, it is not neceſſary to be very nice in ſpunging out the blood, with a view to make the two ſurfaces of the fleſh come entirely into contact, the blood itſelf anſwering a ſimilar purpoſe. In ſeveral caſes, having brought the two portions of looſe ſkin together, I have ſeen the two cut edges unite almoſt immediately, and though the cavity underneath was diſtended with blood, yet it did well, the tumor gradually decreaſing as the blood was abſorbed; this is to be conſidered in the ſame light as an ecchymoſis.

" When the portion of ſkin is not ſufficient to cover the whole wound, and the cut edges cannot be brought together, ſtill the ſkin ſhould be made to cover as much as it can, in order to diminiſh the ſize of the parts that muſt otherwiſe ſuppurate and form a ſore: as, in conſequence of this mode of treatment, the living extravaſated blood is confined in the wound, and coagulating there, unites the two ſurfaces together.

" The mouths of the veſſels are ſoon ſhut, either by inoſculation, or their own power of contraction, and by the blood becoming vaſcular, as in the former ſtated caſe of union by the firſt intention;

and if there ſhould be any ſuperfluous extravaſated blood, we know that it will be afterwards abſorbed.

" The blood being alive, this uniting medium becomes immediately a part of ourſelves, and the parts not being offended by it, no irritation is produced. The red particles are abſorbed, and nothing but the coagulating lymph is retained, which being the true living bond of union, afterwards becomes vaſcular, nervous, &c."

The agency of inflammation in producing union next comes under the author's conſideration. He ſays, " where the former bond of union is loſt in a part, to produce a new one a ſecondary operation takes place, namely, *inflammation*; and if this is likewiſe loſt, then a third mode of union will ariſe, which is by means of granulation.

" If the divided parts are allowed to remain till the mouths of the divided veſſels be entirely ſhut, inflammation will inevitably follow, and will furniſh the ſame materials for union which are contained in extravaſated blood, by throwing out the coagulated lymph; ſo that union may ſtill take place, though ſome time later after the diviſion of the parts. This inflammation I have called the adheſive; and the inflammation that precedes ſuppuration, I have called the ſuppurative inflammation. If the parts, however, continue too long aſunder, ſuppuration muſt follow, and pus is unfriendly to union. We may here obſerve, that ſuppuration takes place on expoſed ſurfaces with a much leſs degree of inflammation and in much leſs time than on thoſe which are not expoſed, and from their not being oppoſed by living ſurfaces, which tend to bring on the adheſive ſtate, they continue it much longer.

" Whether this coagulating lymph iſſues from the half-cloſed mouths of the veſſels which were cut, or from the ſurface of the opened cells, is not eaſily determined; but moſt probably it is from the latter, as it comes on about the time that the ſwelling of the ſurrounding parts begins to appear. There is reaſon to ſuppoſe it to be the ſame kind of diſcharge with that which cauſes the ſwelling, and which is continued through the whole courſe of this ſtage of inflammation; for on examining the dreſſings of ſuch wounds as are allowed to ſuppurate, ſeveral days after the wounds have been made, the lint is generally adhering to the ſurface by means of the coagulating lymph; the ſuppuration not having yet ſufficiently taken place to looſen it.

" When theſe operations are completed in due order, the ſimple operations of the animal are entirely confined to the part, neither the mind nor the conſtitution ſeeming in ſuch caſes to be at all affected, except that there is a feeling of tenderneſs in the part. But whatever theſe ſenſations may be, they ariſe entirely from the injury done, and not from the operation of union, unleſs when the ſuppurative inflammation comes on.

" The inflammation often runs ſo high, even where the parts have been brought into contact, as to deſtroy, by its violence, that union which the extravaſated juices were intended to produce; the conſequence of which is ſuppuration at laſt.

" Is it by this exceſs of inflammation that the extravaſated juices loſe their living principle, and become as it were extraneous bodies? or is it not poſſible, that in theſe caſes the inflammation may be the effect rather than the cauſe of the loſs of the living principle, by the blood firſt loſing its living principle, and inflammation ariſing from it as a conſequence?"

On the *different degrees* and *kinds* of inflammation, the following important obſervations are given by Mr. Hunter. " Inflammation," ſays he, " will in general be in proportion to the exciting cauſe (in which may be included the miſchief done), the conſtitution, and the nature of the part; in all which, as there is great variety, ſo muſt there be in the inflammations. The degrees of inflammation will be more in the adheſive than in the ſuppurative, for the adheſive may have all the degrees of violence between the moſt ſlight inflammation and ſuppuration; but the ſuppurative is a more fixed or determined quantity, for when got to a certain point, it takes a new action, and inflammation ceaſes; however, we have not always inflammation producing ſuppuration when it has arrived to a certain degree of violence, for in ſome it often goes beyond that point which would produce it in others, and in ſuch caſes there is no diſpoſition for ſuppuration, and it ſeems to become ſtationary, for neither has it any diſpoſition for reſolution.

" Spontaneous inflammations which are to ſuppurate, are more violent than thoſe inflammations ariſing in conſequence of an operation or accident, which alſo muſt produce ſuppuration; and thoſe inflammations from either operations or accidents, if they have not produced death in the part operated upon, are more violent, and of greater extent than thoſe where death in the part has been produced.

" The inflammation of a boil or abſceſs is more violent, and commonly more extenſive, than that in conſequence of a cut, or even an amputation of a leg. The inflammation in conſequence of a cut or amputation of a leg, will be more violent than that from a gun-ſhot wound, or from the application of a cauſtic, which produces death in the part, and even although more parts have been deſtroyed by theſe means; neither do ſpecific diſeaſes, except the gout, produce ſo violent inflammation, nor are they commonly ſo painful as what I have called the common inflammation.

" It may appear not to be an eaſy matter to account for all thoſe differences; however it is poſſible, that, in the ſpontaneous inflammation, there is more occaſion for inflammation than ſuppuration; the inflammation being the only action which is neceſſary to produce

the ultimate effect, as, for inſtance, in the gout; in this diſeaſe the inflammation is the only thing neceſſary for its action, and the inflammation runs much higher than many others do which produce ſuppuration.

"The ſpontaneous inflammation ariſes often from diſeaſe, which probably makes the parts more ſuſceptible of inflammation.

"When inflammation ariſes from the irritation of death in a part, let the cauſe of that effect be what it will, whether mechanical, as in bruiſes, gun-ſhot wounds, &c. or by chemical means, as cauſtic, &c. the inflammation is late in coming on, and in compariſon with the others gentle when come on.

"However, in many bruiſes, even where the death of parts has taken place, we have inflammation quick and violent, but then the living parts have alſo ſuffered, and have ſuffered much more than if ſimply wounded.

"In many bruiſes we have alſo inflammations quick and violent, even where death has been produced in a part; but then death does not take place in all the hurt parts, as in many gun-ſhot wounds, ſuch as thoſe attended with fractured bones, in which the ſurrounding parts were only hurt ſo far as to bring on irritation and not death.

"If cauſtics do not act with vigour, they will irritate ſo as to bring on the inflammation ſooner than if they had killed the part quickly.

"Irritating ſubſtances, when of no ſpecific kind, produce inflammation ſooner than other viſible cauſes of inflammation. If of a ſpecific kind, then the time, ſort, and violence, will be according to that kind.

"But an irritating application muſt be continued for ſome time to produce violent inflammation.

"Theſe differences are eaſily accounted for; quick death does not irritate the part killed, and the contiguous living part, not being itſelf hurt, is only irritated to get rid of the dead part.

"A wound is a quick irritation of a living part, ſo that it inflames more readily, and more violently, according to the quantity of irritation; but that cannot be of long ſtanding, as nature ſets about procuring relief. But when irritating ſubſtances are applied, the part inflames quickly, according to their power of irritation; and if they are continued, nature is not allowed to relieve herſelf, but is conſtantly teazed, by which means the inflammation becomes alſo violent."

After noticing the effects of inflammation on the conſtitution, Mr. Hunter obſerves, that,

"Some people are much more ſuſceptible of inflammation than others, even of the common kind, and thoſe probably may be reckoned ſimply irritable. In ſuch it is more violent, and in ſuch it is more apt to ſpread, the ſurrounding parts being ready to act or

ſympathize with an action to which they are prone. Continued ſympathy more readily takes place in ſuch caſes; but this is not univerſal, for we find many very conſiderable inflammations confined to the part irritated, and in ſuch inſtances continued ſympathy is not great, only the part irritated takes up the action violently.

"The term or idea of inflammation may be too general, yet it is probable that it may form a genus, in which there is a number of ſpecies, or it may be more confined in its claſſification, and be reckoned a ſpecies containing ſeveral varieties. Theſe are, however, ſo connected among themſelves, that we cannot juſtly underſtand any one of the ſpecies or varieties without forming ſome idea of the whole, by which means, when treating of any one, we can better contraſt it with the others, which gives us a clearer idea both of the one we are treating of, and of the whole. So far as it appears to be neceſſary to take notice of the different inflammations, as illuſtrative, they may be comprehended in five diviſions: although, I muſt own that if we take in all the ſpecific diſeaſes which produce inflammation, ſuch as the venereal diſeaſe in its different forms, the gout, &c. they may be without number; however, many of them produce very much the ſame appearance and effects with thoſe which are of no ſpecific kind. The ſpecific is of no particular kind, but only the cauſe, and the ſpecific effect is a ſomething ſuperadded. The preſent, viz. the adheſive, with its different effects, as ſuppuration, I ſhall conſider as one. The œdematous, which comes neareſt to the adheſive, forms a ſecond diviſion. The eryſepelatous, the carbuncle, and that which leads immediately to mortification, form a third. There is another inflammation very like chilblains, which is not very lively, and is often in blotches, ſome the breadth of a ſhilling, others of the breadth of half a crown, and even broader, &c. This inflammation certainly ariſes from irritable debility; the blotches look more of a copper-colour, and the ſkin over them is often diſeaſed. All, except the firſt, have a kind of affinity to each other; although I think the œdematous has the leaſt affinity to the three laſt, and many vary ſo as to make it difficult to ſay to which ſpecies the varieties belong. There are a great many other inflammations, but which ariſe from ſome ſpecific cauſe, as the gout, ſcrophula, &c. or poiſons; but as theſe do not explain, or illuſtrate by contraſt, the adheſive or ſuppurative inflammations, I ſhall not give the outlines of them here, except juſt to mention the particulars of the gout, as an inflammation."

After obſerving that the affection of the ſkin in the genuine gout, has all the characters of the true inflammation, and pointing out in what it differs from the adheſive and ſuppurative inflammations, Mr. Hunter proceeds thus:

"It may be diſputed, whether the following are all inflammations or not. They often ariſe from the ſame cauſes; accident, for inſtance, produces all of them. They have certainly many characters

in common, although not always the same result. The vessels becoming enlarged, there is an extravasation, pain, and a separation of the cuticle, but seldom a formation of matter, although there sometimes is, which happens when they have at first more of the adhesive state: and there is a circumstance which I think is common to them, namely, a red streak passing from the inflamed part, generally towards the trunk, although not always in this direction. In common language they are called erysepelatous, although very different; the erysepelatous being one of the best marked inflammations of any. I do not mean to treat of these but in a general way, not even when considering the method of cure. It is probable there is no specific distinction between any of these inflammations but what arises from the constitution or the parts, for we find them all proceeding from what may be called the same accidental cause, which therefore cannot produce any thing specific; the distinctions in the mode of action of the inflamed parts being occasioned by a peculiarity in the constitution, or the nature of the part itself, but probably in the constitution. It has been supposed that the different species or varieties of inflammation arise from the difference in the nature of the part inflamed; but this is certainly not the case; for if it was, we should soon be made acquainted with all the different inflammations in the same person, at the same time, and even in the same wound: for instance, in an amputation of a leg, where we cut through skin, cellular membrane, muscle, tendon, periosteum, bone, and marrow, the skin should give us the inflammation of its kind, the cellular membrane of its kind, the muscles of theirs, the tendons of theirs, the periosteum, bone, marrow, &c. of theirs; but we find it is the same inflammation in them all; it is the adhesive in them all if the parts are brought together; it is the suppurative if parts are exposed. I shall at present only take notice of the four last, as I mean to treat more fully of the first, which cannot be so completely understood without seeing the distinctions.

"What I would call the *œdematous* inflammation, is when the extravasated fluid is water: it has very much the appearance of the adhesive, and probably comes the nearest to it of any, being of a scarlet colour; but much more diffused. The fluid extravasated being principally the serum, renders the swelling more diffused than even the inflammation itself; it is very painful, or rather sore, but there is not so much of the throbbing sensation as in the adhesive inflammation: it appears to be only on the surface, but most probably goes much deeper; for in such cases the extravasated fluid is in too large quantity to be furnished by the cells of the cutis alone; but in this we have not the same guide, as in the adhesive, viz. the swelling and inflammation corresponding with each other. The difference between this inflammation and the adhesive, arises, I conceive, from the principle of inflammation acting upon a dropsical disposition, which is always attended with weakness; whereas a

greater degree of ſtrength would have produced the adheſive inflammation under the ſame cauſe, or irritation; and what makes me conceive this, is, that in many caſes of anaſarcous legs we have exactly this inflammation come on from diſtenſion, which adds to the extravaſation of the ſerum, as well as in moſt caſes of ſcarifications of œdematous parts to evacuate the water. When inflammation takes place, it is much more laſting than the adheſive; and, I believe, ſeldom or ever produces ſuppuration; but if it ſhould run into this ſtage, it is more general, and the whole cellular membrane in the interſtices of parts is apt to mortify and ſlough, producing very extenſive abſceſſes, which are not circumſcribed.

"The *eryſepelatous* inflammation is very peculiar; and moſt inflammations that are not of the true adheſive and ſuppurative kinds, are called ſo, although probably they do not in the leaſt belong to it; and this may ariſe more from the want of terms, than the want of diſcrimination. This inflammation often ariſes ſpontaneouſly, or in conſequence of a low or debilitating fever. It often ariſes from accident, but then it is commonly a ſecondary inflammation, though not always; for the firſt ſhall have gone off, and when ſuppuration was to take place, it ſhall have come kindly on, but afterwards the eryſepelatous ſhall take place."

Mr. Hunter thinks this may not improperly be called a *remote* inflammation, and that it is, in this reſpect, "ſomewhat ſimilar to the locked jaw." He ſays,

"It is more commonly a *cutaneous* inflammation than ſituated in the deeper ſeated parts; although in ſome conſtitutions every inflammation, wherever it exiſts, will moſt probably be of this kind; however, the ſkin appears to be moſt ſuſceptible of it, becauſe it will ſpread over a prodigious ſurface of ſkin, while it does not affect even the cellular membrane underneath; at leaſt not commonly. There is an inflammation which attacks internal canals, which is claſſed with the eryſepelatous, but how far it is the ſame I do not know; it is certainly not the ſuppurative: and as almoſt every other inflammation was formerly called eryſepelatous, this has been ſuppoſed to belong to this kind of inflammation. The inflammation I am ſpeaking of is more common to the throat than any other part, often going down the trachea: whatever it is, it may be conſidered in ſome of its effects to be in direct oppoſition to the adheſive and the ſuppurative inflammations; for where the adheſive moſt readily produces adheſions, there the eryſepelatous does not, as in the common cellular membrane; and where the adheſive ſeldom takes place, excepting from extreme violence, there this inflammation (if eryſepelatous) has a tendency to produce adheſions, as in canals or outlets; it alſo oppoſes, in ſome degree, the ſuppurative, in being backward in producing ſuppuration even in thoſe places where ſuppuration moſt readily takes place, ſuch as canals and outlets; for there, as above obſerved, it more readily throws

out the coagulating lymph. Whatever the inflammation may be, it is certainly attended with nearly the ſame kind of conſtitutional affection. The fever in both appears to be the ſame, viz. accompanied with debility, languor, &c. The extravaſation in conſequence of the eryſepelatous inflammation is not ſo great as in either the adheſive, or the œdematous; nor is it of that kind which produces adheſions between the parts inflamed, which in this inflammation would commonly be unneceſſary, as it ſeldom produces ſuppuration, but is attended with very bad conſequences when it does. It appears to ſupport itſelf by continued ſympathy, for it commonly begins at a point and ſpreads, while it ſhall be getting well, where it firſt began.

"This cannot be merely conſtitutional, for if it was, the parts already inflamed could not recover, if its increaſe in new parts aroſe from the conſtitution; but it gives the idea that when the parts have once gone through this action that they loſe the diſpoſition and become healthy. This property is not peculiar to this inflammation, the ring-worm has this peculiarity, as alſo many cutaneous ulcers."

Mr. Hunter conceives there are two ways of accounting for this; one, "that the whole ſkin is very ſuſceptible of ſuch action, and readily goes on with it by continued ſympathy, and the part having gone through the action, like the ſmall-pox, &c. loſes the diſpoſition, and the action ceaſes. The other is, that the inflammation is ſuch as to contaminate while it ſpreads, but when it has once acted it is cured as above obſerved. If this laſt be a true ſolution, then (ſays the author) the right practice would be to ſtop its progreſs by deſtroying the parts beyond it.

"This inflammation," continues Mr. Hunter, "is more common in the ſummer than in the winter, more eſpecially in hoſpitals; and I think takes place oftener after wounds on the head than any other. I have often ſeen it begin round a wound, on the ſcalp, extending itſelf over the whole head and face; the eye-lids being very much ſwelled, the ears thickened, and it has advanced to the neck, ſhoulders, and body, creeping along both arms, and terminating at the fingers ends; that which attacks the body often goes along the body to both thighs, down the legs, and terminates at the ends of the toes; and while this is going on, it is as expeditiouſly cured behind, and the ſkin peels off the cured parts; however, this is not always the caſe, it often ſtops, and where it proceeds ſo far, it is commonly becoming milder. This inflammation, when it runs along the ſkin, has a determined edge, not loſing itſelf gradually and inſenſibly in the ſkin beyond, as in the true adheſive, and indeed moſt of the inflammations; the ſkin feels as if only a little thickened, and not ſo pliable; for by paſſing the finger along the ſound ſkin to the inflamed, we feel an evident difference. The colour of the ſkin is of a darkiſh red. When it goes deeper than the ſkin into the

cellular membrane, it often ſuppurates; but then I ſuſpect it is not the true eryſepelatous; for in ſuch caſes it commonly produces mortification in the cells, by which air is let looſe; this gives a ſtrange feel, neither of fluctuation nor crepitation; and as there are no adheſions, the matter finds an eaſy paſſage into the common cellular membrane, increaſing the ſame kind of ſuppuration wherever it comes; and as mortification is a conſequence of theſe inflammations, putrefaction enſues, and the diſcharge becomes very offenſive. Whether this difference in the effect of the inflammation ariſes from the nature of the parts, I will not pretend to ſay. This effect takes place about the buttocks and ſides of the anus oftener than anywhere elſe; as indeed do common inflammation and ſuppuration.

"This inflammation commonly begins with fever, lowneſs of ſpirits, and proſtration of ſtrength, loſs of appetite, &c. but it commonly does not laſt long, and the inflammation ſhall ſpread even when the fever is gone off, but then it is not ſo violent: when it produces ſuppuration in the cellular membrane it is often dangerous, both from the diſeaſe itſelf, and the conſequences of the matter diffuſing itſelf much farther. This effect frequently takes place when this inflammation attacks the buttocks or parts near the anus, and often proves fatal. In ſuch caſes, as the ſores ſeldom ulcerate, they ſhould be opened early, for the matter either gets into the cellular membrane from the want of adheſions, or it ſeparates parts that are only attached, as the periоſteum from the bone, muſcles from muſcles, &c. whereas the true ſuppurative ulcerates briſkly, which, therefore, ſhould not be opened early, but allowed to burſt.

"Many inflammations *on the ſkin* which come to ſuppuration, have ſomething of the eryſepelatous diſpoſition, for we ſee them increaſing the circle of inflammation, the cuticle ſeparating, matter formed underneath from the cutis, and the ſore healing in the centre; they perhaps begin like a pimple, but ſpread in that way to the breadth of a ſixpence, ſhilling, or crown-piece; ſuch often take place on the fingers.

"The inflammation that *produces the carbuncle* is of a different nature from any of the former; it is ſtationary with reſpect to place, and is pretty much circumſcribed, even forming a broad, flat, firm tumor; it begins in the ſkin almoſt like a pimple, and goes deeper and deeper, ſpreading with a broad baſe under the ſkin in the cellular membrane; and although conſiderably tumefied, yet this does not ariſe from the extravaſation of coagulating lymph producing adheſions which are to retain life, for the very cells into which it is extravaſated become dead. It produces a ſuppuration, but not an abſceſs, ſomewhat ſimilar to the eryſepelatous when the inflammation paſſes into the cellular membrane, for as there are no adheſions, the matter lies in the cells where it was formed, almoſt like water in an anaſarca; but ſtill it is not diffuſed through the uninflamed cellular membrane, as in the eryſepelatous, for it appears to

extend no further than the inflammation; one would almoſt imagine that there was a limitation to the extent, beyond which this ſpecies of inflammation could not go, and at theſe limits the adheſive inflammation took place to confine the matter within the bounds of the carbuncle. A diffuſed ulceration on the inſide for the exit of the matter takes place, making a number of openings in the ſkin: there are generally more carbuncles than one at the ſame time, a great number ſucceeding each other, which would almoſt ſeem to produce each other in this ſucceſſion; they are commonly more on the trunk of the body than any-where elſe; however, I have ſeen them on the head, and ſometimes on the extremities, although but ſeldom."

After obſerving that the carbuncle more commonly affects the poſterior part of the body than the anterior, and that this peculiar inflammation attacks perſons who are more beyond the middle age than at it, and very few under it, Mr. Hunter proceeds thus:

"It is moſt common," ſays he, "in thoſe that have lived well. I never ſaw but one patient of this kind in an hoſpital. It appears to have ſome affinity to the boil; but the boil differs in this reſpect, that it has more of the true inflammation, therefore ſpreads leſs, and is more peculiar to the young than the old, which may be the reaſon why it partakes more of the true inflammation.

"As death is produced in a great deal of the cellular membrane, and, I believe, in it only, except the ſkin giving way, which I believe is by ulceration principally, it becomes a queſtion, whether this mortification ariſes from the nature of the inflammation, or rather from the matter being confined in the cells of the cellular membrane? I rather ſuſpect the latter; for I find that if this matter eſcapes from theſe cells and comes into uninflamed cells, it produces mortification there. This is like the urine, for whenever the urine eſcapes into the cellular membrane it there produces mortification; the colour of the ſkin is at firſt more vivid than afterwards, for it becomes of a purple colour.

"Inflammation often produces *mortification* or death in the part inflamed. This commonly takes place in old people that are become very much debilitated, and chiefly in the lower extremities. I ſuſpect it to be ſomewhat ſimilar to the carbuncle, viz. principally in thoſe who have lived well, although not ſo much confined to them as the carbuncle; however, it takes place in the young, where great debility has been produced from diſeaſe, eſpecially thoſe diſeaſes that have debility as a principle, ſuch as what are commonly called putrid fevers; but the ſituation of theſe is not ſo determined, and in ſuch, inflammation hardly takes place without an immediate exciting cauſe, as the application of bliſters, &c. Death in a part ſometimes takes place, almoſt immediately, without inflammation; but this is not to the preſent purpoſe. Where mortification ſucceeds inflammation in the extremities, eſpecially in elderly perſons,

there is often an early ſeparation of the cuticle which forms a bliſter, filled with a bloody ſerum: and we ſhall obſerve dark browniſh ſpots, which conſiſt of extravaſated blood in the true cutis, and which ſhall at laſt bliſter, and then the cutis forms a ſlough.

" Such inflammations have little of the adheſive tumefaction in them, but more of the œdematous; are not clear or tranſparent, but rather of a duſky red: as the colour of the inflamed parts ſhow ſomething of its nature, it is to be obſerved that it is different in all theſe inflammations from that of the true adheſive, and as we have reaſon to believe that the circulation is quicker in the adheſive inflammation than is natural, and that the colour ariſes from this cauſe, we may ſuppoſe that the motion of the blood in theſe is languid, and that it aſſumes the venous appearance, even in the arteries.

" In moſt of theſe four inflammations there is an appearance that often ariſes, which is a reddiſh ſtreak commonly paſſing from the inflamed parts towards the ſource of the circulation, but not always in this direction; ſometimes juſt the contrary; and this is more certain when it happens to take place in an extremity, becauſe there we know the courſe of all the veſſels better; but it does not always ariſe from the part inflamed. I have ſeen this laſt ſpecies of inflammation attack the toes, and red ſtreaks run up the foot, terminating about the ankle, while there were ſeveral ariſing on the fore part of the leg, juſt below the knee. They often make a network on the leg, and are frequently a forerunner, and an attendant on mortification. They ſeldom go farther than a bluſh in the ſkin, ſeldom thicken, but are more of the œdematous kind; however, we ſometimes find hard cords running from ſores and inflammations, but theſe are commonly deeper ſeated, and I have ſuſpected them to be veins; as a proof of this, I have ſeen the ſuperficial veins of the leg have the ſkin red over them, ſimilar to thoſe above deſcribed, and the veins have felt hard under the finger. Theſe reddiſh ſtreaks are ſuppoſed to be abſorbents, becoming inflamed by their carrying a ſtimulating fluid. I am apt to ſuppoſe them to be abſorbents, but I do not conceive that this effect ariſes from abſorption. If it aroſe from ſuch a cauſe, it ſhould be uniform, the cauſe ſhould always exiſt when the effect takes place. It is firſt to be obſerved, that it only takes place in certain conſtitutions, in which abſorption, one way or other, explains nothing; and I find, upon obſervation, that this effect ſhall be coeval with the inflammation where no ſuppuration has taken place: I have ſeen it ariſe from accident, prior to the poſſibility of inflammation taking place, viz. in the time of the pain ariſing from the immediate effects of the accident; this was in the finger, from the prick of a clean needle, which had been for ſome time piercing new buck-ſkin leather; the glands in the armpit were ſore, ſickneſs, attended with its uſual ſymptoms, ſuch as oppreſſion, was nearly as immediate. Its direction from the ſource of

the circulation is another ſtrong proof of its not ariſing from abſorption, and its taking place at ſome diſtance is alſo a corroboration of the ſame opinion. Another ſtrong circumſtance in favour of this opinion is, that the morbid poiſons do not produce this effect, where we know abſorption has taken place. Thus the venereal ſeldom or ever produces it. The hard cord paſſing from the prepuce along the upper part of the penis, I do not conceive to be of this kind. In the ſmall-pox, after inoculation, it has been obſerved, but I imagine it was only in the above-mentioned conſtitutions. I could conceive it to ariſe in the plague, if there was any local diſeaſe. I am, therefore, rather apt to attribute this appearance to the irritation running along the lymphatics, more eſpecially in ſuch conſtitutions; and as we do not allow the veins to be abſorbents, their being affected muſt be ſuppoſed to ariſe from the ſame cauſe. Whenever we ſee this effect, we may, in ſome degree, form an opinion of the kind of inflammation, and that it is not the moſt favourable."

In the peruſal of theſe ingenious remarks of Mr. Hunter, the reader will no doubt be highly gratified and informed, though he may occaſionally find reaſon to withhold his unreſerved acquieſcence. We ſhall now proceed, ſeverally, to introduce an abridgment of the author's remarks on *adheſive*, *ſuppurative*, and *ulcerative* inflammations, which are not only highly curious, but of great practical utility.

"The act of inflammation," ſays Mr. Hunter, "would appear to be an increaſed action of the veſſels:" to this effect of a ſtimulus which excites inflammation, the author gives the name of 'a bluſh.' "But whatever action it is, it takes place, moſt probably, in the ſmaller veſſels, for it may be confined almoſt to a point where nothing but the ſmalleſt veſſels exiſt. The larger veſſels may be conſidered as only the conveyers of the materials, for the ſmaller to act upon and diſpoſe of according to the different intentions; however, inflammation in a part, is not only an action of the ſmaller veſſels in the part itſelf, but in the larger veſſels leading to it. This is proved by a whitlow taking place on the end of a finger; for although the inflammation itſelf ſhall be confined to the end of a finger, and the inflammatory ſenſation or throbbing be ſituated in this part, yet we can feel by our hands, when we graſp the finger, a ſtrong pulſation in the two arteries leading to the inflamed part, while no ſuch pulſation can be felt in the other fingers; and if the inflammation is very conſiderable, the artery, as high as the wriſt, will be ſenſibly affected, which proves that the arterial ſyſtem is at that time dilating itſelf, and allowing a much larger quantity of blood to paſs than is uſual. This is probably by continued ſympathy.

"Where the inflammation affects the conſtitution, the veſſels of the ſyſtem rather contract, and keep as it were ſtationary,

which ſtationary contraction is more or leſs according to the ſtate of the conſtitution; in ſtrong healthy conſtitutions whoſe powers are equal to the neceſſary actions, or in parts that affect the conſtitution leſs, this contraction is leſs and leſs ſtationary."

"In inflammation of the eye, which is commonly of the tunica conjunctiva, the progreſs of inflammation may, in part, be accurately obſerved, although not ſo progreſſively as in a wound. The contraſt between the red veſſel and the white of the eye, under this coat, is very conſpicuous, and although we do not ſee the veſſels enlarging in this coat, yet we ſee the progreſs they have made, the white appears as if it was becoming more vaſcular, and theſe veſſels larger, till at laſt the whole tunica conjunctiva ſhall appear as one maſs of blood, looking more like extravaſated blood than a congeries of veſſels, although I believe it is commonly the laſt.

"From theſe circumſtances it muſt appear, that a much larger quantity of blood paſſes through parts when inflamed than when in a natural ſtate, which is according to the common rules of the animal economy; for whenever a part has more to do than ſimply to ſupport itſelf, the blood is there collected in larger quantity; this we find to take place univerſally in thoſe parts whoſe powers are called up to action by ſome neceſſary operation to be performed, whether natural or diſeaſed.

"As the veſſels become larger, and the part becomes more of the colour of the blood, it is to be ſuppoſed there is more blood in the part; and as the true inflammatory colour is ſcarlet, or that colour which the blood has when in the arteries, one would from hence conclude, either that the arteries were principally dilated, or at leaſt, if the veins are equally diſtended, that the blood undergoes no change in ſuch inflammation in its paſſage from the arteries into the veins, which I think is moſt probably the caſe; and this may ariſe from the quickneſs of its paſſage through thoſe veſſels.

"When inflammation takes place in parts that have a degree of tranſparency, that tranſparency is leſſened. This is, probably, beſt ſeen in membranes, ſuch as thoſe membranes which line cavities, or cover bodies in thoſe cavities, ſuch as the pia-mater, where, in a natural ſtate, we may obſerve the blood-veſſels to be very diſtinct. But when we ſee the blood-veſſels fuller than common, yet diſtinct, in ſuch membranes, we are not to call that inflammation, although it may be the firſt ſtep, as we find to be the caſe in the firſt action of the veſſels in conſequence of ſuch irritation as will end in inflammation."—

"The veſſels, both arteries and veins, in the inflamed part are enlarged, and the part becomes viſibly more vaſcular, from which we ſhould ſuſpect, that inſtead of an increaſed contraction, there was rather what would appear an increaſed relaxation of their muſcular powers, being, as we might ſuppoſe, left to the elaſticity entirely. This would be reducing them to a ſtate of paralyſis ſimply;

but the power of muſcular contraction would ſeem to give way in inflammation, for they certainly dilate more in inflammation than the extent of the elaſtic power would allow; and it muſt alſo be ſuppoſed, that the elaſtic power of the artery muſt be dilated in the ſame proportion. The contents of the circulation being thrown out upon ſuch occaſions, would, from conſidering it in thoſe lights, rather confirm us in that opinion: and when we conſider the whole of this as a neceſſary operation of nature, we muſt ſuppoſe it ſomething more than ſimply a common relaxation; we muſt ſuppoſe it an action in the parts to produce an increaſe of ſize to anſwer particular purpoſes; and this I ſhould call the action of dilatation, as we ſee the uterus increaſe in ſize in the time of uterine-geſtation, as well as the os tincæ in the time of labour, the conſequence of the preceding actions, and neceſſary for the completion of thoſe which are to follow."

Mr. Hunter adds, that "the force of the circulation ſeems to have ſome ſhare in this effect;" but he conſiders it only as a ſecondary cauſe.

"Whatever purpoſe," ſays he, "this increaſe of the ſize of the veſſels may anſwer, we muſt ſuppoſe it allows a greater quantity of blood to paſs through the inflamed part than in the natural ſtate, which ſuppoſition is ſupported by many other obſervations.

"The part inflamed, I have already obſerved, becomes to appearance more vaſcular than when in the natural ſtate, and it is probable that it is really ſo, both from new veſſels being ſet up in the inflamed part, as well as the new and adventitious uniting ſubſtance becoming vaſcular. Beſides, the veſſels of the parts are enlarged, ſo that the red blood paſſes further than common, which increaſes thoſe appearances. But the brain appears to be an exception to theſe general rules; for in all diſeaſes of the brain, where the effects were ſuch as are commonly the conſequence of inflammation, ſuch as ſuppuration from accidents, I never could find the above appearances; the brain may, perhaps, go directly into ſuppuration, as ſometimes the peritoneum does; but its ſlowneſs of going into ſuppuration after the accident, would make us ſuppoſe, *a priori*, that there was ſufficient time for adheſions to form.

Speaking *of the colour, ſwelling, and pain of inflamed parts*, Mr. Hunter obſerves, that the red *colour* of an inflamed part is brightened and approaches to purple, according to the degree or nature of the inflammation; and that the *ſwelling* is owing to the extravaſation of the coagulating lymph, and ſome ſerum. Both are naturally in proportion to the inflammation, and may be more or leſs according to circumſtances. They of courſe are greateſt at the point of inflammation, becoming leſs and leſs as it extends into the ſurrounding parts.

"The whole ſwelling looks like a part of the body only a little

changed, without any appearance of containing extraneous matter; and indeed it is simply formed by an extravasation of fluids without their having undergone any visible or material change, except coagulation."

Of the *pain* produced by inflammation Mr. Hunter gives a very ingenious, though somewhat difficult explanation.

"In the adhesive state of inflammation," he says, "it is generally but very inconsiderable, especially if it is to go no further, and is perhaps more of a heavy than an acute pain. When it happens on the skin, it often begins with an itching; but as the inflammation is passing from the adhesive to the suppurative, the parts then undergo a greater change than before, and the pain grows more and more acute, till it becomes very considerable. The nerves also acquire at that time a degree of sensibility, which renders them much more susceptible of impression than when they are in their natural state; thus an inflamed part is not only painful in itself, but it communicates impressions to the mind independent of pain, which do not arise from a natural sound part. This pain increases every time the arteries are dilated, whence it would appear that the arteries do not contract by their muscular power, in their systole, for if they did, we might expect a considerable pain in that action which would be at the full of the pulse. Whether this pain arises from the distension of the artery by the force of the heart, or whether it arises from the action of distension from the force of the artery itself, is not easily determined. We know that diseased muscles give much pain in their contraction, perhaps more than they do when stretched.

"That the *degree* of inflammation which becomes the cause of *adhesions* gives but little pain, is proved from the dissections of dead bodies; for we seldom or never find a body in dissection which has not adhesions in some of the larger cavities; and yet it may reasonably be supposed, that many of these persons never had any acute symptoms, or violent pain in those parts; indeed, we find many strong adhesions upon the opening of dead bodies, in parts which the friends of these persons never heard mention, during life, as the subject of a single complaint.

"That adhesions can be produced from very slight inflammation, is proved in ruptures in consequence of wearing a truss; for we find the slight pressure of a truss exciting such action as to thicken parts, by which means the two sides of the sack are united, though there be hardly any sensation in the part; we also see, in cases where this inflammation arises from violence, that it gives little or no pain. A man shall be shot through the cavity of the abdomen, and if none of the contained parts are materially hurt, the adhesive inflammation shall take place in all the internal parts contiguous to the wound made by the ball, and yet no great degree of pain shall be felt. This assertion is still proved by the little pain suffered

after many bruiſes, where there is evident inflammation; and in ſimple fractures, the pain from the inflammation is very trifling, whatever it may be from the laceration of the parts. But this will be according to the degree of inflammation, what ſtage it is in, and what parts are inflamed.

"We find it a common principle in the animal machine, that every part increaſes in ſome degree according to the action required. Thus we find muſcles increaſe in ſize when much exerciſed, veſſels become larger in proportion to the neceſſity of ſupply, as, for inſtance, in the gravid uterus, &c."

Mr. Hunter obſerves, that, when impreſſed, the ſenſations in many parts of the body, when in a natural ſtate, are peculiar ſenſations; and when thoſe parts are injured, they give a ſort of *pain* peculiar alſo to themſelves. He alſo remarks, that the ſame mode of impreſſion gives a peculiar ſenſation to one part, while it gives unequivocal pain to another. This Mr. Hunter illuſtrates in a variety of ways: "Thus," ſays he, "what will produce ſickneſs in the ſtomach, will produce pain in the colon. When the ſenſation of pain is in a vital part, it is ſomewhat different from moſt of thoſe pains that are common. Thus, when the pain ariſes from an injury done to the head, the ſenſation is a heavy ſtupifying pain, rendering the perſon affected unfit to pay attention to other ſenſations, and is often attended with ſickneſs, from the ſtomach ſympathizing with it."

"But," continues he, "the ſkin, muſcles, and the cellular membrane, in common, give an acute pain, which rather rouſes than oppreſſes, if not too great."

The author's account of the cauſe of this variety of ſenſations is ſomewhat obſcure, we ſhall therefore proceed to give an analyſis of the remaining part of his ſubject.

Speaking of the heat produced in a part that is inflamed, Mr. Hunter ſays, "From all the obſervations and experiments I have made, I do not find that a local inflammation can increaſe the local heat above the natural heat of the animal; and when in parts whoſe natural heat is inferior to that which is at the ſource of the circulation, it does not riſe ſo high: thoſe animals too, which appear to have no power either of increaſe or decreaſe in health, naturally appear to be equally deficient in diſeaſe; as will be ſeen in the experiments.

"I ſuſpect that the blood has an ultimate ſtandard heat in itſelf, when in health, and that nothing can increaſe that heat but ſome univerſal or conſtitutional affection; and probably the ſympathetic fever is ſuch as has no power in this way, and that the whole power of local inflammation is only to increaſe it a little in the part, but that it cannot bring it above the ſtandard heat at the ſource, nor even up to it in parts that naturally or commonly do not come up to it.

" As inflammation is the principal inſtance capable of producing local increaſed heat, I have taken the opportunity of examining inflammations, both when ſpontaneous and in conſequence of operations. I have alſo made ſeveral experiments for that purpoſe, which are ſimilar to operations, and cannot ſay that I ever ſaw, from all theſe experiments and obſervations, a caſe where the heat was really ſo much increaſed, as it appeared to be to the ſenſations."

After ſome experiments remarkable for their ingenuity, and for which we refer to the work itſelf, the author ſpeaks of the time the adheſive inflammation commences after its cauſe, and in what reſpects it is imperfect in its conſequences. Of this diſcuſſion we ſhall only notice the concluding paſſages. Speaking of thoſe caſes where there is *a tendency to mortify from the beginning*, as in the ſtrangulated hernia, he ſays, " We often find the adheſive and ſuppurative inflammation going hand in hand. All of theſe cauſes and effects account for the violence of the ſymptoms, the quickneſs of the progreſs of the diſeaſe, and its fatal conſequences beyond ſuch inflammations as have only the true adheſive progreſs, or where it takes place perfectly prior to ſuppuration.

" It ſeems to appear from obſervation, that ſome ſurfaces of the body do not ſo readily unite by the coagulating lymph as others, and therefore, on ſuch ſurfaces, there is commonly a much larger quantity of this matter thrown out than probably would have been if union had readily taken place; for we may ſuppoſe, that where once union has taken place, extravaſation is at an end. Thus, we ſee in (what we may ſuppoſe) inflammation of the heart, that the coagulating lymph is thrown out on the exterior ſurface in vaſt quantities, while at the ſame time the heart ſhall not adhere to the pericardium. This is not only ſeen in the human, but in other animals. In an ox, the heart was furred all over, and in ſome places, the coagulating lymph was near an inch in thickneſs. The external ſurface of ſuch hearts have an uncommon appearance; the outer ſurface of the coagulating lymph is extremely irregular, appearing very much like the external ſurface of a ſponge, while the baſe, or attachment to the heart is very ſolid and firm. However, in many inſtances we find the pericardium adhering to the heart, and generally in pretty cloſe contact, which would make us ſuppoſe that the extent of motion of thoſe two parts on one another is not great. Theſe adheſions affect the pulſe much, which is a good reaſon why nature avoids them as much as poſſible. On the other hand, it ſeems deducible from obſervation, that neither the pia nor dura mater are apt to throw out much coagulating lymph, for here it would produce compreſſion; and, therefore, we ſeldom find adheſions between them. In conſequence of ſuch accidents as produce ſuppuration between theſe two membranes, we ſeldom or ever find the ſurrounding part adhering ſo as to confine the matter to the ſuppurating ſurface."

" Inflammation of the ſkin, or ſuch as approaches to the ſkin, produces in general a ſeparation of the cuticle; often of the hair, or the nails. Theſe effects ariſe ſooner or later, according to the nature and degree of the inflammation, but more particularly according to its nature. They take place the leaſt and lateſt in the true adheſive inflammation, which is always attended with the greateſt ſtrength. In ſuch caſes, the ſeparation does not happen till the inflammation has ſubſided; and as a proof of this, in the gout it is leaſt and lateſt of all; for this is always a healthy inflammation, otherwiſe it would not take place; but in weak habits, at the early part of the diſeaſe, there are often veſications, which are filled with ſerum, ſometimes with coagulating lymph, &c. both of theſe are ſometimes tinged with red blood. When the inflammation is of a weak kind, tending to mortification, the cuticle commonly ſeparates early during the time of inflammation, almoſt beginning with it, and of courſe the veſications will be filled with ſerum, and often with the red globules. We may obſerve in wounds of the ſkin which are not allowed to heal by the firſt intention, that a ſeparation of the cuticle will take place at the edges of the wound, and this will extend according to the nature of the inflammation, which is according to the nature of the conſtitution: this will be attended with other concomitant appearances, ſuch as flabby edges and thin matter. I conceive, in the weak habit, it depends on an action of the inflammation itſelf; but in the ſtrong, it depends on a ſtate in which the parts are left to ſeparate the cuticle.

" This ſeparation ariſes, I apprehend, from a degree of weakneſs approaching to a kind of death in the connection between the cuticle and cutis, from life being in this part naturally very weak. In the beginning of mortification it is produced; in the œdematous and eryſepelatous inflammations it is greateſt, and in putrefaction of dead bodies it is the firſt operation. I ſuſpect too, that a bliſtering plaſter, hot water, &c. only kill the uniting parts, by which means an irritation is produced in the cutis, and the extravaſation is according to that irritation."

The nature of *the uniting medium in inflammations* is thus deſcribed by Mr. Hunter:

" In the adheſive inflammation," ſays he, " the veſſels being enlarged, begin to ſeparate from the maſs ſome portion of the coagulating lymph, with ſome ſerum, and alſo red globules, and throw it out on the internal ſurface; probably through the exhaling veſſels, or, perhaps, open new ones, and cover the ſides of thoſe cells, which eaſily unite with the oppoſite, with which they are in contact, forming the firſt proceſs of adheſion.

" That this is really the caſe, and that this effect has taken place in conſequence of inflammation, is evident from the following obſervations. In all large cavities, where we can make our obſervations with certainty, when in the ſtate of inflammation, we find dif-

fuſed over the ſides, or through the cavity, a ſubſtance exactly ſimilar to the coagulating lymph when ſeparated from the ſerum, and red blood, after common bleeding. That the blood, when thrown out of the circulation from an inflammatory ſtate of the veſſels, as well as the blood itſelf, unites parts together, is probably beſt ſeen in the inflammation of the larger cavities above mentioned. The following I ſhall give as an example, which I have often obſerved on the peritoneum of thoſe who have died in conſequence of inflammation of this membrane. The inteſtines are more or leſs united to one another, and, according to the ſtage of the inflammation, this union is ſtronger or weaker; in ſome it is ſo ſtrong as to admit of ſome force to pull them aſunder; the ſmooth peritoneal coat is, as it were, loſt, having become cellular, like cellular membrane. When the veſſels of this part are injected, we ſhall find, that in thoſe parts where a ſeparation has been made by laceration, previous to the injecting, the injection will appear on that ſurface like ſmall ſpots or drops, which ſhews that the veſſels had at leaſt paſſed to the very ſurface of the inteſtines.

" In parts where the union was preſerved, I have obſerved the three following facts. On ſeparating the united parts, I have obſerved, in ſome places, the veſſels come to the ſurface of the inteſtines, and then terminate all at once. In other places, I could obſerve the veſſels paſſing from the inteſtine into the extravaſated ſubſtance, and there ramifying, ſo that the veſſel was plainly continued from the old into the new.

" In a vaſt number of inſtances, I have obſerved, that in the ſubſtance of the extravaſation, there were a great number of ſpots of red blood in it, ſo that it looked mottled. The ſame appearance was obſervable on the ſurface of ſeparation, between the old ſubſtance and the new, a good deal like petechial ſpots. How this red blood got here is the thing to be conſidered, eſpecially as a good deal was within the ſubſtance of the coagulum. Was it extravaſated along with the coagulating lymph? In this caſe, I ſhould have rather ſuppoſed it would have been more diffuſed, and if not diffuſed, more attached to the inteſtine, and not in the centre of the coagulum; if it had been extravaſation, one would have expected extravaſation of injection, but we had none in any of theſe places; I have therefore ſuſpected, that parts have the power of making veſſels and red blood independent of circulation. This appears to be evidently the caſe with the chick in the egg.

" I obſerved, when I was treating of the blood, that it was capable of becoming vaſcular, when depoſited either by accident, or for particular purpoſes; and I had reaſon to believe, that a coagulum, or coagulating lymph, had a power of becoming vaſcular in itſelf, when it could be ſupplied with blood, and mentioned the coagulum in a large artery as an inſtance. Likewiſe, when I was treating of union by the firſt intention, I explained the intercourſe

eſtabliſhed by the uniting medium becoming vaſcular, and thoſe veſſels uniting acroſs by a proceſs, called inoſculation. The ſame reaſoning is applicable to the union by means of the adheſive inflammation; for it is the blood in all caſes that is to become vaſcular; but this takes place ſooner or later, according to the apparent neceſſity. In ſome it becomes vaſcular, immediately; in others very late; and indeed, in ſome hardly ever, according to the degree of utility to ariſe from that change. Where it becomes vaſcular ſooneſt, there the veſſels are found alſo in greateſt numbers, the two effects depending on the ſame principle."

The author illuſtrates this by many inſtances in which we cannot properly accompany him; but particularly by the reſult of an experiment on a dog, with a view to ſhow the important conſequences of the power of adheſion between two internal ſurfaces in contact.

After the death of the animal in conſequence of an inciſion being made into the cheſt, it was found, that "the cavity of the cheſt all round was filled with air. That part of the external ſurface of the lungs which did not adhere, that is to ſay, the upper ſurface of the diaphragm, and that part of the pleura which covered the ribs were entirely free from inflammation, or ſuppuration; this cavity, from theſe adheſions, being rendered a perfect cavity, ſhews that air, ſimply, has no power to excite inflammation when the cavity is otherwiſe perfect, which the adheſions had effected; this ſhows alſo, that adheſions of two ſurfaces round the expoſed part, exclude every part from the neceſſity of inflammation, as was explained when treating of inflammation.

"From the connection between the living powers of the ſolids and the fluids, we can hardly ſuppoſe that ſuch an uncommon action could take place in the vaſcular ſyſtem, without producing its effects upon the fluids; and, therefore, from reaſoning we might ſuppoſe, that the coagulating lymph undergoes ſome changes in its paſſage through the inflamed veſſels, which obliges it to coagulate more immediately, or much ſooner than it otherwiſe would.

"For in thoſe caſes of inflamed arms, after bleeding, and in inflammations in conſequence of other cauſes, we find that the cavities of the veins are in many places furred over, and in others united by means of the coagulating lymph. Now if this coagulating lymph is ſimilar in its productions to that which we have been deſcribing, it muſt have been thrown out from the vaſa vaſorum, theſe veſſels having ſeparated it and poured it into the cavity of the veins, and it muſt there have coagulated immediately; in this ſeparation, therefore, from the blood, it muſt have undergone ſome change, ariſing from the actions of the veſſels; for if this lymph was no more than the coagulating lymph with its common properties, or the properties common to that which is circulating in the ſame vein which receives it, it would in ſuch caſes only

continue to throw in more coagulated lymph, in addition to what was circulating, and therefore, probably, it would be carried along with the blood to the heart, as a part of the common mass. From this we should infer that this coagulating matter is not simply the coagulating lymph, such as it is when circulating, but somewhat different, from having undergone a change in its passage through the inflamed vessels, partaking of the disposition of those solids which are inflamed, through which it passed. This process cannot, therefore, be supposed to be merely extravasation; for I conceive that an œdema would be a consequence of simple extravasation. But this may be taken up in another point of view, and upon the same principle. The inflamed vessels may give a disposition to the blood, as it is moving slowly along, to coagulate on its surface; and this is probably the more just idea of the two; as we find that the vessels, both veins and arteries, can give this disposition, and to a very great extent: we find in the beginning of mortification, the blood coagulating in the vessels, so as to fill them up entirely, and this preceding the mortification, seems to be for the purpose of securing the vessel before it is to give way; we, therefore, cannot doubt of a coagulating principle being given to the blood from the vessels; and as a further proof of this, we may observe that the extravasated coagulating lymph, which either produces adhesions, or forms tumors (which is often the case), is always of the nature of the diseased solids that produced it. If the case is venereal, the new substance is of the same nature; if cancerous, it is cancerous; for I find that it has, when absorbed, the power of contaminating, similar to matter or pus produced by the sores or ulcers of such diseases; the absorbent glands being often affected by the absorption of the coagulating matter of a schirrous breast.

"Whatever change the coagulating lymph has undergone in this operation of inflammation, it seems so far the same, as to retain still the nature of the coagulating lymph, and to possess the living principle; this is most probably in a greater degree, and therefore, the coagulating lymph is still better fitted to be formed into a part of the solids of the body, as will be taken notice of when we come to treat of the state of the blood in inflammation.

"But it is not absolutely necessary that the coagulating lymph should first undergo a change in the extravasated vessels, before it can become a living solid, or unite living solids; for we find that common blood extravasated from a ruptured vessel is, perhaps, equally efficacious in this respect; therefore the red globules do not retard union, but they may promote it."

From what Mr. Hunter has said of the *condition of the blood*, and of the *pulse*, in inflammation, we extract the following detached passages:

"From what has been said of the living power of the blood, we

muſt allow," ſays he, "that it will be commonly affected much in the ſame manner with the conſtitution, and that diſeaſe will have nearly the ſame effect upon it, as it has on the body; becauſe, the ſame living principle runs through the whole. We find this to be nearly the caſe; for till a diſeaſe has affected the conſtitution, the blood continues the ſame as before; but as the conſtitution becomes affected, the blood alſo becomes affected, and undergoes the ſame changes, which probably may be aſcribed to contiguous ſympathy, between the veſſels and the blood; and we ſhall find that the change in the blood is often as much expreſſive of diſeaſe as any other part of the body. It is expreſſive of ſtrong action, as well as of weak action; but as it does not give ſenſation, it cannot convey to the mind all the varieties of diſeaſe that may take place in it; yet I could conceive, if the blood was to be primarily affected, that an impreſſion would be made upon the mind, from its affecting the veſſels in which it moved. However, it is not always the caſe that the ſtate of the blood and the other ſymptoms are expreſſive exactly of the ſame thing; the blood often expreſſing leſs, and often more; when the action of the ſolids is of the inflammatory kind, or which, perhaps, is the ſame thing, when there is too great an action of the ſolids, the blood more readily admits of a ſeparation of its viſible parts, and the coagulating lymph coagulates more ſlowly, but becomes firmer when coagulated; this laſt circumſtance, however, might be ſuppoſed not to be ſo clear, for its firmneſs may be owing to its want of the red particles, which certainly give the blood a brittleneſs in proportion to their quantity; but although this may have ſome effect, yet it is very little; for we find blood of looſe texture in ſome inflammations, when deprived of its red part; when blood has this diſpoſition it is called ſizy blood. Theſe changes in the nature of the blood, depend ſo much upon the above-mentioned cauſes of inflammation, that it is impoſſible to ſay whether they do not conſtitute the firſt univerſal effect produced from the local inflammation, and whether the conſtitutional is an effect of this change in the blood. I knew a man who was ſtabbed in the loins, and, according to the conſequent ſymptoms, was moſt probably wounded or hurt in ſome viſcus within the abdomen. At firſt he had no ſymptoms, but ſimple pain in the part, I therefore only bled him, by way of precaution, and the blood was perfectly natural; in leſs than a quarter of an hour after, conſtitutional ſymptoms came on, ſuch as rigor, ſickneſs, &c. and on opening the ſame orifice, and taking away more blood, this ſecond quantity had a very thick and ſtrong buff upon it, having all the appearance of inflammatory blood; while this conſtitutional diſpoſition laſted, which was ſome time, his blood continued the ſame, which was proved by the ſubſequent bleedings. The ſubſiding, however, of the red globules in the blood when in an inflamed ſtate, although pretty frequent, is not always an attendant, or in other words (and

perhaps upon ſome other principle) the blood is not always attended with this appearance, when the viſible ſymptoms are the ſame."

"Whether the diſpoſition for inflammation, and the change produced in the blood, ariſe from a real increaſe of animal life, or whether it is only an increaſe of a diſpoſition to act with the full powers which the machine is already in poſſeſſion of, is not eaſily determined; but it appears to be certain, that it is either the one or the other: there are ſome circumſtances, however, that would incline us to ſuſpect it to be the latter, becauſe there is often inflammation when the powers of the machine are but weak, where it appears to be only an exertion of very weak powers, ariſing from ſome irritation produced; in ſuch caſes the blood will ſhew ſigns of weakneſs although ſizy.

"This appears to be equally the caſe in local inflammation, and inflammatory fevers, or in the ſymptomatic fever. That it is an increaſe of the one or the other, and that the ſenſible effect produced ariſes from the action taking place, both in the ſolids and fluids, is proved by the method of treatment: on the other hand, where there is great debility in the ſolids, where the powers of preſervation (the firſt animal powers) are weak, therefore the action weak, and where of courſe the body muſt have a tendency to diſſolution, there we find the very reverſe of the former appearance in the blood. Inſtead of ſeparating diſtinctly, and coagulating firmly, we have the whole maſs of blood keeping mixed, and hardly any coagulation, only becoming of a thicker conſiſtence."

This, it appears, often takes place in thoſe who die ſuddenly; in which caſes Mr. Hunter conjectures that the blood dies firſt, and alſo inſtantaneouſly. After ſpeaking of ſome peculiarities in the diſpoſition of the blood in particular diſeaſes, the author ſpeaks thus of the pulſe.

"The pulſe is often as ſtrong a ſign of the ſtate of the conſtitution as any other action that takes place in it, though it is not ſo always; but as the pulſe has but one circumſtance attending it, that we can really meaſure, all the others being referrible to the ſenſation or feeling of the perſon who is to judge of it, the true ſtate of the pulſe is not eaſily aſcertained. The knowledge of the ſoft, the hard, and the thrill, are ſuch as can only be acquired with accuracy by the habit of feeling pulſes in theſe different ſtates, and by many is not to be attained; for ſimple ſenſation in the minds of any two men are ſeldom alike. Thus, we find, it happens with reſpect to muſic; for what would be diſagreeable and not in harmony to one ear, which is nice and accuſtomed to the harmony of ſounds, will not be ſo to another."

"In the conſideration of the peculiarities of the pulſe, it is always neceſſary to obſerve, that there are two powers acting to produce them, the heart and the arteries; that one part of the pulſe belongs to the heart alone, another to the arteries alone, and

the third is a compound of both; both the actions of the heart and arteries do not always correſpond; the heart may be in a ſtate of irritation, and act quickly in its ſyſtole, while the arteries may be acting ſlowly; for the heart is to be conſidered as a local part, while the veſſels muſt be conſidered as univerſal, or even conſtitutional. The ſtroke (which is the pulſe), with the number of them that are made in a given time, whence the pulſe is commonly called quick or ſlow, their regularity and irregularity as to time, and the quickneſs of the ſtroke itſelf, belongs to the heart. The quickneſs of the heart's action often takes place, although the pulſations are not frequent, which gives a kind of reſt or halt to the artery or pulſe, eſpecially if the pulſe be not frequent. The hardneſs, the vibratory thrill, the ſlowneſs of the ſyſtole, with the fulneſs and ſmallneſs of the pulſe, belong to the arteries. As the pulſe ariſes from the actions of the ſolids or machine, its ſtate will be of courſe according to the nature of the machine at the time, and therefore is capable of being in one of theſe ſtates, natural and diſeaſed.

"In moſt diſeaſes of the conſtitution, whether originating from it, or ariſing in conſequence of diſeaſes of parts, where the conſtitution becomes affected by ſympathy, the pulſe is altered from a natural to a diſeaſed ſtate, the degree of which will be regulated by thoſe affections. This alteration is commonly ſo conſtant, and ſo regularly of the nature of the diſeaſe, that it is one of the firſt modes of intelligence we have recourſe to, in our enquiries into its nature; but alone it is not always a certain guide; for where there are peculiarities of conſtitution, we find the pulſe correſponding to thoſe peculiarities, and, perhaps, in direct contradiction to the accuſtomed ſtate of the local affection. The ſame parts too, under diſeaſe, give very irregular, or uncertain ſigns in the actions of the heart and veſſels, ſuch as diſeaſes, or injuries done to the brain.

"The varieties which the pulſe admits of are ſeveral. It is increaſed in its number of ſtrokes, or it is diminiſhed. It is regular or irregular, as to time, in its ſtrokes; it is quick in its ſtroke, or diaſtole, and ſlow in its ſyſtole. It is hard in its diaſtole, and it vibrates in its diaſtole.

"In moſt caſes, probably, where the conſtitution is in a ſtate of irritation, the pulſe will be quick and frequent in its number of ſtrokes in a given time, and the artery will become hard from a conſtant, or ſpaſmodic contraction of its muſcular coats, ſo as to give the feel of hardneſs to the touch; beſides which, the diaſtole of the artery is not regularly uniform and ſmooth, but proceeds by a vaſt number of ſtops, or interruptions, which are ſo quick as to give the feel of a vibration, or what we would expreſs by a thrill."—

"The quick, hard, and vibratory pulſe is generally an attendant upon inflammations; and whether it be attended with fulneſs, or the ontrary, depends a good deal upon the part that is inflamed;

which either increaſes or decreaſes the irritability, which will be deſcribed in treating of the different parts inflamed.

" In ſuch a ſtate of the conſtitution as produces ſuch a pulſe, the blood, which appears to be only a paſſive body, acted upon by the heart, ſo as to produce the diaſtole of the artery, and reacted on by the veſſels, making the complete pulſe, this blood, I ſay, is generally found in a different ſtate from that where there are not theſe ſymptoms in the pulſe; they, as it were, conſtantly attend each other, or are the reciprocal cauſe and effects of one another, as was taken notice of when I was ſpeaking of the ſtate of the blood in inflammation.

" From the account I then gave of the ſtate of the blood in inflammation, and have now given of the pulſe, under the ſame action, it ſhould naturally be expected, that they ſhould explain each other; which, for the firſt part, they certainly do; yet, theſe appearances of the blood, and the kind of pulſe, are every now and then appearing to be in oppoſition to each other, in their common attending circumſtances; but this cannot be known till the perſon is bled: when the pulſe is quick and hard, with a kind of vibration in the action, we generally have ſizy blood."

Mr. Hunter gives a deciſive inſtance of this in the caſe of a gentleman, who was bled under the circumſtances here deſcribed. He alſo adds the following caſe:

" A man, aged ſixty-eight years, had an occaſional inflammation in one of his legs, which often ulcerated, and which ſeemed to ariſe more from a defect in the conſtitution than to be ſimply local. In thoſe indiſpoſitions, his pulſe ſeldom exceeded *forty* in the minute, and as he began to get better, his pulſe became *more and more frequent.*"

Mr. Hunter, in the ſucceeding ſection, ſhews that inflammation produces different effects on the whole ſyſtem, according to the ſtructure and ſituation of the parts inflamed. Of the ſpirit and tenor of this portion of his doctrine, the following paſſages will give ſome idea.

" In common parts, as muſcle, cellular membrane, ſkin, &c. the ſymptoms will be acute; the pulſe ſtrong and full, and the more ſo, if it be felt near to the heart; but perhaps not ſo quick as when the part is far from it; ſince there will be leſs irritability. The ſtomach will ſympathize leſs, and the blood will be puſhed further into the ſmaller veſſels.

" If the inflammation is in tendinous, ligamentous, or bony parts, the ſymptoms will be leſs acute, the ſtomach will ſympathize more, the pulſe will not be ſo full, but perhaps quicker, becauſe there will be more irritability, and the blood will not be ſo much puſhed into the ſmaller veſſels, and therefore forſake the ſkin more."

From the author's general reflections on the reſolution of in-

flammation, we extract only what refers more immediately to practice.

"The cure of inflammation," says he, "is *resolution*; and the attempt towards it is principally to be made when the inflammation is in the adhesive state; for we find that often it goes no further, but subsides, and this is resolution; probably the sooner after its commencement it is the better. The object of the atttempt is to prevent suppuration taking place, although suppuration may be considered as a resolution, but it is the mode of resolution we commonly wish to avoid. Resolution is in general only to be attempted, with any probability of success, under the following circumstances; when the inflammation is in consequence of the constitution, or a disease of the part: secondly, in cases of accident, where there is either no exposure, or where it has been removed in time; as, for example, by bringing the parts in contact: thirdly, where the life of the part has not been destroyed. In all such cases we find that resolution can take place; but in those cases arising from accident, and a continuance of exposure joined, or where death of the parts is produced by the accident, it becomes impossible to hinder the suppuration from taking place.

"I have already observed, that in many bruises, as well as simple fractures, where the cavities are not exposed, and where they are to heal by the first and second intention, the inflammation, in most of these cases, is capable of being resolved; although, in some such cases, the inflammation runs so high as to threaten suppuration. I have also already shewn, that in parts which have been divided and exposed, the inflammation is, by bringing them together, in a great measure prevented; or if it has taken place previous to the union, that the same operation of union is sufficient to produce resolution: and I have likewise shewn that where parts were not brought together, nature attempted to prevent inflammation, by covering the wound with blood, and forming an eschar, which, in many cases, will either prevent, or remove inflammation; all of which shews a power of resolution, even in the cases where the parts have been exposed."

After pointing out certain cases in which the resolution of inflammation is not to be desired, the ingenious author proceeds to consider the means by which resolution is to be obtained. Speaking of those which are to be effected through the medium of the constitution, he says, "If the inflammation is attended with considerable action and power, as it were, increasing in itself, then the modes of resolution are to be put in practice: the one by producing a contraction of the vessels, the other by soothing or lessening irritability, or the action of dilatation.

"The first, or contraction of the vessels, is produced in two ways; one by producing weakness; for weakness excites the action

of contraction of the veſſels; the other, by ſuch applications as induce the veſſels to contract.

"The means of producing abſolute weakneſs are *bleeding* and *purging*; but the bleeding alſo produces irritability for a time, and is often attended by a temporary weakneſs of another kind, viz. ſickneſs.

"The inconvenience, however, ariſing from this practice is, that the ſound parts muſt nearly, in the ſame proportion, ſuffer with the inflamed; for, by bringing the inflamed part upon a par with health, the ſound parts muſt be brought much lower, ſo as to be too low. The ſoothing may be produced by ſedatives, relaxants, antiſtimulants, &c. ſuch as many ſudorifics, anodynes, &c.

"The firſt method will have the greateſt, the moſt permanent, and the moſt laſting effect; becauſe, if it has any effect at all, the diſeaſed action cannot be ſoon renewed. The ſecond will act as an auxilliary; for ſo far as irritation is a cauſe, this will alſo leſſen it: and the two ſhould go hand in hand; for wherever we leſſen power, we ſhould, at the ſame time, leſſen the diſpoſition for action, or elſe we may increaſe the diſpoſition: but neither bleeding, purging, nor ſickneſs, can poſſibly leſſen the original inflammatory diſpoſition; for none of them will reſolve a venereal inflammation, when mercury will; nor will they reſolve the eryſepelatous inflammation, although that inflammation has the very action for which we ſhould bleed in the common inflammation, viz. dilatation of veſſels. However, theſe means may, in ſome ſenſe, be reckoned direct; for whatever will produce the action of contraction in the veſſels, is counteracting the action of dilatation. Leſſening the power of action belonging to any diſpoſition, can only leſſen or protract the effects, which, however, will be of ſingular ſervice, as leſs miſchief will be done, and it will often give the diſpoſition time to wear itſelf out. Means employed, on this principle, ſhould be ſuch as give the feel of weakneſs to the conſtitution; which will affect the part, and will make the veſſels contract, but this practice ſhould not be carried ſo far as to produce the ſenſe of too much weakneſs, for then the heart acts with great force, and the arteries dilate.

"Bleeding then, as a general principle, is to be put in practice; but this muſt be done with judgment; for I conceive the effects of bleeding to be very extenſive. Beſides, the loſs of any quantity of blood being univerſally felt, in proportion to the quantity loſt, an univerſal alarm is excited, and a greater contraction of the veſſels enſues, than ſimply in proportion to this quantity, in conſequence, as it would appear, of a ſympathetic affection with the part bleeding.

"Too much blood, in an inflammation, is a load upon the actions of the circulation. Too little, produces debility and irritability;

becauſe, there is a loſs of powers, with an increaſed action to keep up, which is now not ſupported. It would ſeem that violent actions of a ſtrong arterial ſyſtem, required leſs blood than even the natural actions; and even leſs ſtill than a weak or irritable ſyſtem: from whence we muſt ſee, that bleeding can either relieve inflammatory action, or increaſe it, and therefore is not to be uſed at random.

"As many patients that ſeem to require bleeding have been already bled, it may not be improper to enquire how they bear, or are affected by bleeding; for, certainly, all conſtitutions (independent of every other circumſtance) do not bear this evacuation equally, and it is probable that its effects on inflammation may be nearly in the ſame proportion; if ſo, it becomes a very uſeful caution; for although the loſs of blood may, as a general principle, be ſet down as a weakener, and probably the greateſt, as we can kill by ſuch means, yet the loſs of certain quantities, in many conſtitutions, is neceſſary for health: this is either when there is a diſpoſition to make too much blood, or a conſtitution that cannot bear the uſual quantity; in ſuch, when known, bleeding with freedom is certainly neceſſary. If the inflammation is known to be attended with real powers, bleeding is abſolutely neceſſary, in ſuch quantity as to take off from the force of the circulation, which ariſes from too much blood; or if that is not ſufficient, then as much as will cauſe a contraction of the veſſels; but in caſes of too great an action of weak parts, then the proper quantity to be taken, is no more than may aſſiſt the dilatation of the veſſels, which will leſſen the violence of motion in the blood, or remove the ſenſation, in the part inflamed, of having too much to do; the quantity, therefore, muſt be regulated according to the ſymptoms, and other circumſtances; for inſtance, according to the viſible indications."

Mr. Hunter obſerves, that "every part of the body, under inflammation, will not bear bleeding alike;" and believes that "the conſtitution bears bleeding beſt, when the inflammation is in parts not vital, and thoſe near the ſource of the circulation. Whatever diſturbs ſome of the vital parts, depreſſes, but not equally in all; and in them it becomes more neceſſary to be particular, for in accidents of the brain, bleeding freely, even ſo as to produce ſickneſs and fainting, is neceſſary. It is probable, that the ſickneſs attending ſuch accidents, is deſigned to leſſen the influx to the head, and occaſion the veſſels of the brain to contract.

The *indications for bleeding* are, firſt, according to the violence of the inflammation, joined with the ſtrength of the conſtitution, which will in general point out the kind of inflammation. Secondly, according to the diſpoſition to form much blood: thirdly, according to the nature of the part, whether vital or not: fourthly, according to its ſituation, in point of diſtance from the heart: fifthly, according to the effect of the inflammation on the conſtitution."

The following obſervation is highly worthy of the practitioner's notice.

"With regard to this evacuation," ſays Mr. Hunter, "it is worthy of particular conſideration, whether or not, in all caſes where it can be put in practice, bleeding *in or near the part* will anſwer better than taking the blood from the *general habit*; for certainly leſs may be removed in this way, ſo as to have equal effect upon the part inflamed (and probably upon every other diſeaſe that is relieved by bleeding), and yet affect the conſtitution leſs; for although, in many caſes, the general habit may be relieved by bleeding, yet the part affected, where it can act, will, in all caſes, require this evacuation moſt, and local bleeding will keep nearer theſe proportions, whereas taking blood from the general ſyſtem is juſt the reverſe. That local bleeding has very conſiderable effects on the inflamed part, is proved by the gout; for applying leeches to the part inflamed, commonly relieves that part, and often almoſt immediately*. We find that bleeding by leeches alone will remove a tumor in the breaſt, having all the appearances of a ſchirrus, which cannot be conſidered as inflammatory; its powers, therefore, extend beyond inflammation. We find relief by bleeding in the temporal artery, or jugular vein, for complaints in the brain; or cupping and bleeding with leeches, on or near the part; as applying leeches to the temples in inflammations of the eye.

"I have obſerved that there is ſomething ſimilar to ſympathetic affection in bleeding. I conceive that all the ſympathetic powers, the univerſal, continued, and contiguous, may be brought into action from the local influence of bleeding. Thus, bleeding in the part inflamed, I can conceive, does more than ſimply emptying the veſſels mechanically, for that would be ſoon reſtored from the general circulation; but it acts by continued ſympathy, viz. the veſſels of the part being opened, they contract for their own defence, and this is carried further among the veſſels of the part; ſo that bleeding from the part acts in two ways, viz. mechanically, by relieving the veſſels of ſome blood, ſo as allow them to contract in proportion as the load is taken off; and alſo to excite them to contraction, in order to prevent the effuſion of blood. I ſuppoſe, likewiſe, that contiguous ſympathy comes into action; for this would appear from practice and obſervation to be a principle in bleeding; therefore, in inflammation of contiguous parts, it is proper to bleed from the ſkin oppoſite to them, as from the ſkin of the abdomen, in complaints of the liver, ſtomach, and bowels; and likewiſe from the loins in inflammatory affections of the kidneys. In affections of the lungs, bleeding oppoſite to them is of ſervice; but in ſuch caſes, it is not clear where the inflammation is; for if in the pleura, then it does not act upon this principle, but by conti-

* It is not meant here to recommend bleeding in this diſeaſe.

nued ſympathy: bleeding on the ſcalp relieves head-achs; and the relief given to the teſticle by bleeding from the ſcrotum, in inflammation of that body, proves the principle.

"Where the firſt indication for bleeding takes place, viz. where there is violent inflammation, with ſtrength of conſtitution, bleeding freely will be of ſingular ſervice. The ſame mode of practice is alſo to be followed under the circumſtance of ſtrength, with reſpect to the ſecond, third, fourth, and fifth; but each will not require the ſame quantity to be taken under equal ſtrength of conſtitution, as will be taken notice of when treating of them ſeparately. As it ſeldom happens that bleeding once will be ſufficient in a conſiderable inflammation, the firſt, or preceding blood taken, becomes a ſymptom of the diſeaſe. If the coagulating lymph is long in coagulating, ſo that the globules have time to ſubſide, there will be what is called a thick buff; and if its ſurface is conſiderably cupped, then future bleedings may be uſed with leſs caution; becauſe ſuch appearance indicates ſtrong powers of coagulation, which always ſhews ſtrength in the ſolids; but if the blood is weak in its powers of coagulation, lies flat in the diſh, then we muſt be cautious in our future bleedings; or if it was ſtrong at firſt in its powers of coagulation, and after repeated bleedings becomes weak, then we muſt not purſue this further; but in ſome caſes it is proper to purſue it to this point, for we ſhall ſometimes find that the inflammatory ſymptoms will not ceaſe after repeated bleedings, if the ſtrength continues; but the moment a degree of looſeneſs is produced in the blood, that moment will the inflammatory action ceaſe. The following caſe is a ſtrong inſtance of this. A lady had a violent cough, tightneſs in reſpiration, loſs of appetite, ſtrong ſizy blood, and the ſymptoms continued to the ſixth bleeding, when the blood was not quite ſo ſizy; but the moſt remarkable change was, its remaining flat on the ſurface. Upon this bleeding, all the ſymptoms diſappeared; and here, although the blood became weak in its power of coagulation, yet it did not produce irritability in the conſtitution, the veſſels of the inflamed parts having ſtill had power to contract. On the other hand, there may be indications for bleeding ſparingly: firſt, when there is too much action, with weakened powers: ſecondly, when there is a diſpoſition to form but little blood: thirdly, when the part affected is far from the ſource of the circulation.

"From the above three diſpoſitions that require bleeding ſparingly, or with caution, I may obſerve, that it will moſt probably be proper in all ſuch caſes to bleed from, or as near the part affected as poſſible, in order to have the greateſt effect, with the loſs of the leaſt quantity of blood; more ſo than when the conſtitution is ſtrong; becauſe the conſtitution in ſuch caſes ſhould feel the loſs of blood as little as poſſible. If from the part, leeches will anſwer beſt, becauſe commonly little irritation follows the wound

of a leech: however, this can only be put in practice in inflammations not very remote from the ſurface. Yet in many caſes the blood cannot be taken away from the part itſelf, but only from ſome neighbouring part, ſo as to affect the part inflamed: thus, we bleed in the temporal artery for inflammation of the eyes; we bleed in the jugular veins for inflammation of the brain; and alſo in the temporal artery, to leſſen the column of blood going to the brain, by the internal carotids. But in many ſituations it will, probably, be impoſſible to do this, with any hope of ſucceſs, and therefore we may have recourſe to the ſympathetic affections before deſcribed.

"Too much action, with ſmall powers, may often, if not always, be claſſed with the irritable conſtitution, and bleeding ſhould then be performed with very great caution."

After relating two ſtriking inſtances of this, Mr. Hunter ſuggeſts the following cautions reſpecting blood-letting in inflammations.

"Where there is a diſpoſition," ſays he, "to form but little blood, when known, bleeding ſhould be performed with great caution.

"When the inflammation is far from the ſource of the circulation, the ſame precautions are neceſſary. In general it can be taken away from the part in ſuch caſes. But theſe are only ſo many facts, that require peculiar ſymptoms to aſcertain them.

"The common indications of bleeding, beſides inflammation, are too often very little to be relied upon; and I ſhall conſider them no further than as it concerns inflammation; which will indeed throw light on other caſes. The pulſe is the great indication in inflammation; but not always to be depended upon."

"The kind of blood is of great conſequence to be known; for although it ſhould prove ſizy, yet if it lies ſquat in the baſon, and is not firm in texture, and if the ſymptoms, at the ſame time, are very violent, bleeding muſt be performed very ſparingly, if at all; for I ſuſpect that under ſuch a ſtate of blood, if the ſymptoms continue, bleeding is not the proper mode of treatment." The caſes of this kind, which the author relates, are ſtrong proofs of this.

Since the *pulſe*, independent of all other conſiderations, is *not an abſolute criterion*, and as ſizy blood, and a ſtrong coagulum are equivocal proofs, Mr. Hunter next enquires whether there be any *collateral circumſtances* that can throw light on the ſubject, ſo as to enable the ſurgeon to determine whether it be right to bleed or not, where the pulſe does not, of itſelf, ſeem to indicate it. "Let us remember," ſays he, "that in treating of inflammation of different parts, I took notice of the pulſe peculiar to each part, which I may now be allowed to repeat. *Firſt*, I obſerved that an inflammation in parts not vital, or ſuch as the ſtomach did not ſympathize with, if there were great powers, and the conſtitution not very irritable, the pulſe was full, frequent, and hard. *Secondly*, that on

the contrary, in inflammations of the ſame parts, if the conſtitution was weak, irritable, &c. that then the pulſe was ſmall, frequent, and hard, although perhaps not ſo much ſo as when in vital parts. *Thirdly*, that when the inflammation is in a vital part, ſuch as the ſtomach, inteſtines, or ſuch as the ſtomach readily ſympathizes with, then the pulſe is quick, ſmall, and hard, ſimilar to the above. Now, in the firſt-ſtated poſitions we have ſome guide, for in the firſt of theſe, viz. where the pulſe is ſtrong, &c. there bleeding is moſt probably abſolutely neceſſary, and the ſymptoms, with the ſtate of blood joined, will determine better the future conduct; but in the ſecond, where the pulſe is ſmall, very frequent and hard, bleeding ſhould be performed with great caution; yet in inflammations of the ſecond ſtated parts, the conſtitution ſeems to be more irritable, giving more the ſigns of weakneſs, as if leſs in the power of the conſtitution to manage."

"However," continues the author, "bleeding ſhould in all caſes be performed with great caution, more particularly at firſt; and no more taken than appears to be really neceſſary; it ſhould only be done to eaſe the conſtitution, or the part, and rather lower it where the conſtitution can bear it: but if the conſtitution is already below, or brought below a certain point, or gives the ſigns of it from the ſituation of the diſeaſe, then an irritable habit takes place, which is an increaſed diſpoſition to act without the power to act with. This, of itſelf, becomes a cauſe of the continuance of the original diſpoſition, and therefore will admit neither of reſolution, nor ſuppuration, but continue in a ſtate of inflammation; which is a much worſe diſeaſe, than the former.

"Upon any other principle than thoſe above mentioned, I cannot ſee why bleeding ſhould have ſuch effects in inflammation as it ſometimes has. If conſidered in a mechanical light, as ſimply leſſening the quantity of blood, it cannot account for it; becauſe the removal of any natural mechanical power, can never remove a cauſe which neither took its riſe from, nor is ſupported by it: however, in this light it may be of ſome ſervice; becauſe, all the actions relative to the blood's motion will be performed with more eaſe to the ſolids, when the quantity is well proportioned.

"It is probably from that connection between the ſolids and fluids, that the conſtitution, or a part, is in a ſtate of perfect quietude, or health, in which we find that the fluids are, and ought to be, in a large quantity: but in a ſtate of inflammation, or increaſed powers and actions, thoſe proportions do not correſpond, at leaſt in the parts inflamed; and by producing the equilibrium between the two, ſuitable to ſuch a ſtate, the body becomes, ſo far as this one circumſtance can affect it, in a ſtate of health; and this in many caſes will caſt the balance in favour of health: it is not, however, ſufficient to produce this effect in all inflammations."

Relative to the propriety of blood-letting from parts peculiarly ſituated with reſpect to the parts inflamed, ſuch as bleeding in the left ſide for an inflammation in the right, upon the principle of *derivation*, Mr. Hunter expreſſes himſelf doubtfully.

Of the *internal means* uſed for the reſolution of inflammation, Mr. Hunter obſerves, they are "ſuch as tend to have ſimilar effects to that which is produced by bleeding; namely, *lowering the conſtitution*, or the action of the parts; and this has uſually been performed principally by *purges*; and the medicines that were given to remove, or leſſen the effects of inflammation on the conſtitution, have been ſuch as generally tend to leſſen fever, or the effects that the inflammation has upon the conſtitution." Theſe, the author obſerves, though capable of reducing the ſtrength conſiderably, yet ſtill their effect is not ſo permanent as that of bleeding. He ſays, purging rather lowers action, without diminiſhing ſtrength; and that if a perſon was to feel the loſs of blood equal to a purge, that ſenſation would be more laſting. "Indeed," ſays Mr. Hunter, "many conſtitutions rather acquire ſtrength upon being gently purged; particularly ſuch as have been living above par; but ſuch ſtrength as is acquired by putting the body in good order, I ſhould ſuppoſe is not inimical to inflammation."

With regard to the uſe of purging in irritable habits, where the inflammation becomes more diffuſed, we find ſome important cautions, ſimilar to thoſe on the uſe of the lancet.

The author next obſerves, that "medicines, which have the power of producing ſickneſs, leſſen the action, and even the general powers of life, for a time, in conſequence of every part of the body ſympathizing with the ſtomach, and their effects are pretty quick.

"Sickneſs lowers the pulſe; makes the ſmaller veſſels contract, and rather diſpoſes the ſkin for perſpiration, but not of the active or warm kind; but I believe it ſhould proceed no farther than ſickneſs; for the act of vomiting is rather a counteraction to that effect, and produces its effect from another cauſe, and of courſe of another kind, which I believe rather rouſes: it is probably an action ariſing from the feel of weakneſs, and intended to relieve the perſon from that weakneſs. It is ſimilar to the hot fit of an ague; a counteraction to the cold one. There are few ſo weak, but they will bear vomiting, but cannot bear ſickneſs long.

"If we had medicines, which, when given internally, could be taken into the conſtitution, and were endowed with a power of making the veſſels contract, ſuch, I apprehend, would be proper medicines. Bark has certainly this property, and is of ſingular ſervice, I believe, in every inflammation attended with weakneſs, and therefore, I conceive, ſhould be oftener given than is commonly done; but it is ſuppoſed to give ſtrength which would not accord

with inflammations attended with too much ſtrength and conſiderable irritation."

The following remarks on topical remedies in inflammation deſerve particular attention.

"*Applications* to the body to cure or reſolve inflammations are, with regard to their mode of application, of two kinds; one is applied to the part inflamed, the other to ſome diſtant part: the firſt may be called local or abſolute, reſpecting the part itſelf; the ſecond, relative: but even the firſt may be conſidered as having a relative effect in one of its modes of action, viz. that called repulſion, from which local applications have by ſome been objected to, and it is principally local applications that can repel, although not literally.

"The firſt, or abſolute effects of medicine, may be divided into two kinds, viz. one, the ſimple cure of the part; the ſecond, producing an irritation of another kind in the part; both, however, act locally, and their ultimate effect is local. Local applications to a part, where that application poſſeſſes really the powers of reſolution, muſt be much more efficacious than any of the other modes of reſolution; for inſtance, mercury has much greater powers when applied immediately to the venereal complaint, than when applied to the neareſt ſurface; where, however, we have not medicines that can reſolve inflammation by application, then of courſe the other method is the moſt efficacious; but whether we have external or local applications which have really a tendency to leſſen the inflammatory diſpoſition, is not well aſcertained. I doubt our being in poſſeſſion of many that can remove the immediate cauſe. Such would of courſe remove the action, or if not wholly, would at leaſt leſſen it, and allow the inflammation to go off.

"But moſt of our powers in this way appear to be of the ſoothing kind, which, therefore, leſſen the action, although the cauſe may ſtill exiſt, and hence the effects are alſo leſſened. This either produces a termination of the inflammation, or it is protracted, the cauſe leſſens, and the inflammation wears itſelf out.

"As inflammation has too much action, which action gives the idea of ſtrength, ſuch applications as weaken have been recommended, and cold is one of them. *Cold*, according to its degrees, produces two very different effects, one is the exciting of action without leſſening the powers, the other is abſolutely debilitating, while at the ſame time it excites action, if carried too far. In the firſt, it becomes like ſuitable exerciſe to the vaſcular ſyſtem, as bodily exerciſe is to the muſcles, increaſing ſtrength; but when carried or continued beyond this point, it leſſens the powers, and becomes a weakener, calling up the action of reſiſtance after the powers are leſſened; therefore cold ſhould not be indiſcriminately uſed, and ſhould be well proportioned to the powers.

"*Cold* produces the action of contraction in the veſſels, which is an action of weakneſs. A degree of cold ſuddenly applied, which

hardly produces more than the ſenſe of cold, excites action after the immediate effect is over, which is the action of dilatation, and which is the effect of the cold-bath when it agrees; and as cold produces weakneſs in proportion to its degree, its application ſhould not be carried too far, for then it produces a much worſe diſeaſe, irritability; or over action to the ſtrength of the parts, and then indolence too often commences. Cold might be ſuppoſed to act on an inflamed part, ſimilar to its action on a frozen part, reſtraining action, keeping it within the ſtrength of the part in the one caſe, ſo as not to allow death to take place from over action; and in the other, to keep it within bounds*.

"*Lead* is alſo ſuppoſed to have conſiderable effects in this way; but I believe much more is aſcribed to it than it deſerves.

"The property of lead appears to be that of leſſening the powers and not the action, therefore ſhould never be uſed but when the powers are too ſtrong, and acting with too much violence: however, lead certainly has the power of producing the contraction of the veſſels, and therefore where there is great ſtrength, lead is certainly a powerful application.

"Applications which can weaken ſhould never be applied to an irritable inflammation, eſpecially if the irritability ariſes from weakneſs; I am certain I have ſeen lead increaſe ſuch inflammations, particularly in many inflammations of the eyes and the eyelids; and I believe it is a bad application in all ſcrofulous caſes; in ſuch caſes the parts ſhould be ſtrengthened without producing action.

"*Warmth*, more eſpecially when joined with moiſture, called fomentation, is commonly had recourſe to; but I am certain that warmth when as much as the ſenſative principle can bear, excites action; but whether it is the action of inflammation, or the action of the contraction of the veſſels, I cannot determine. We ſee that many patients cannot bear it, and therefore it might be ſuppoſed to increaſe the action of dilatation, and do hurt; but if that pain ariſes from the contraction of the inflamed veſſels, then it is doing good, but this I doubt, becauſe I rather conceive the action of contraction would give eaſe.

"*Acids* have certainly a ſedative power, as alſo alcohol, and I believe many of the neutral ſalts."

* As cold can be applied upon two very different principles, Mr. Hunter thinks it neceſſary to mention which of theſe is here meant. He ſays, when cold is applied either within the powers of reſiſtance of the part, to excite heat, or only for ſo ſhort a time as to give the ſtimulus of cold, then a reaction takes place, and warmth is the conſequence; but if cold is applied beyond the powers of reſiſtance, then a contraction of the veſſels takes place, and that contraction is in ſome degree permanent. But this muſt be done with caution, for if continued too long, it will produce debility, and action will be excited which will be irritable. In the preſent, the application of cold ſhould only be ſufficient to excite the contraction of the veſſels, and that not continued too long, for reaſons above aſſigned.

In the ſection which treats of derivation, repulſion, tranſlation, &c. we find the following uſeful remarks:

"I have already obſerved," ſays Mr. Hunter, "that local applications were principally ſuppoſed to repel, by the firſt or ſecond mode of action; yet internal medicines having a ſpecific, or what might be called a local action, although given internally, may repel by ſtopping the diſeaſed action in the part which it chiefly affects. ſuch as mercury falling on the mouth, might repel a diſeaſe from the mouth. Hemlock might do the ſame, with regard to the head; or turpentine with regard to the urethra. In the laſt, we often find by taking balſams, that by ſtopping the diſcharge, a ſwelling of the teſticles comes on, or an irritable bladder. As repulſion in this way is not ſo evident, it is leſs noticed. The uncertainty in the power of medicines, reſpecting repulſion, has led ſurgeons into more errors than any other principle in the animal œconomy, with regard to diſeaſes. It has prevented their acting in many caſes, where they might have done it with ſafety and effect. A ſtronger inſtance cannot be given than in that ſpecies of the venereal diſeaſe, called a gonorrhœa, which they did not venture to cure by local applications, for fear of driving it into the conſtitution, and producing a pox; but they did not conſider that a gonorrhœa does not ariſe from the conſtitution, but may be ſaid to ariſe from accident, or at leaſt is entirely local, and therefore no repulſion could take place. The idea of repelling was firſt introduced when local diſeaſes were ſuppoſed to ariſe from a depoſit or derivation of humors to a part, and is ſtill retained by thoſe who cannot or will not allow themſelves to think better; yet ſtill the term might be applied to diſeaſed action, for the removal of many diſeaſed actions from a part which fall on ſome other part, is certainly the repelling of that diſeaſed action; but ſince it is not ſubdued, but only driven from the part, as is often the caſe with the gout, no cure is performed by this means.

"Both or either of the two local methods of removing diſeaſe, juſt now mentioned, viz. either by ſimply curing the diſeaſe, or by deſtroying the diſeaſed action, in conſequence of exciting an action of another kind, may produce the effect called repulſion; but the former, I believe, can only take place in inflammations, ariſing from the conſtitution, and which being prevented from ſettling in this part, return upon the conſtitution again, and often fall upon ſome other part, viz one next in order of ſuſceptibility for ſuch inflammation, as is often the caſe in the gout, and in many other diſeaſes beſide inflammation, as in many nervous complaints. St. Vitus' dance is a remarkable inſtance of it; but in this caſe it is not to be conſidered as a cure of the diſeaſe, but only as a ſuſpenſion of its action in this part."

When treating on the *uſe of the adheſive inflammation*, the author ſays:

"Its utility may be ſaid to be both local and conſtitutional, but

certainly moſt ſo with regard to the firſt. Its utility is moſt evident when it ariſes from a diſeaſe in a part, whether this proceeds from the conſtitution or otherwiſe, and when it does, it muſt be conſidered as ariſing from a ſtate in which that part cannot exiſt, as in expoſure, and therefore is the firſt ſtep towards a cure. It is often of ſervice in thoſe caſes which ariſe from violence, although not ſo neceſſarily ſo, the injured parts not being always under the neceſſity of having recourſe to it, as was ſhewn in treating of union by the firſt intention.

"When the adheſive inflammation ariſes from the conſtitution, it may depend on ſome diſeaſe of that conſtitution; and if ſo, it may be conceived to be of uſe to it, eſpecially if it ſhould be ſuppoſed to be the termination of an univerſal irritation in a local one, by that means relieving the conſtitution of the former, as in the gout; but when it is only the ſimple adheſive inflammation that takes place, I am rather apt to think that it is more a part of the diſeaſe, than a termination of it, or an act of the conſtitution.

"The adheſive inflammation ſerves as a check to the ſuppurative, by making parts, which otherwiſe muſt infallibly fall into that ſtate, previouſly unite, in order to prevent its acceſs, as was deſcribed in the adheſive inflammation being limited; and where it cannot produce this effect, ſo as altogether to hinder the ſuppurative inflammation itſelf from taking place, it becomes in moſt caſes a check upon the extent of it. This we ſee evidently to be the caſe in large cavities, as in the tunica vaginalis after the operation of the hydrocele; for after the water has made its eſcape, parts of the collapſed ſack frequently unite to other parts of the ſame ſack by this inflammation, and thereby preclude the ſuppurative from extending beyond theſe adheſions, which ſo far prevents the intention of the ſurgeon from having its full effect; and often on the other hand, the adheſive ſtate of the inflammation takes place univerſally in this bag, in conſequence of the palliative cure, which produces the radical, and thereby prevents a relapſe. In the hernia it performs a cure by uniting the two ſides of the ſack together, by means of ſlight preſſure, ſo that we ſhould underſtand perfectly its mode of action, where it can prevent a cure, and where it can perform one. In ſtill larger cavities, ſuch as the abdomen, where often only a partial inflammation takes place, as is frequently the caſe after child-bearing, and in wounds of this cavity, we find this inflammation produced, which either prevents the ſuppurative altogether, or if it does not, it unites the parts ſurrounding the ſuppurative centre, and confines the ſuppuration to that point; and as the abſceſs increaſes in ſize, the adheſive inflammation ſpreads, uniting the parts as it ſpreads, ſo that the general cavity is excluded. Thus the ſuppuration is confined to the firſt point, and forms there a kind of circumſcribed abſceſs.

"In inflammations of the pleura or ſurface of the lungs, the ſame

thing happens, for the adhesive inflammation takes place, and the surfaces are united; which union going before the suppurative, confines it to certain limits, so that distinct abscesses are formed in this union of the parts; and the whole cavity of the thorax is not involved in a general suppuration; such cases are called the spurious empyema.

"The cellular membrane, every-where in the body, is united exactly in the same manner, the sides of the cells throw out, or, as it were, sweat out the uniting matter, which fills the cavities and unites the whole into one mass.

"The adhesive inflammation often disposes the parts to form a cyst, or bag; this is generally to cover some extraneous body that does not irritate so much as to produce suppuration; such as a sack formed to enclose a bullet, pieces of glass, &c.

"With the same wise views it unites the parts or cellular membrane which lies between an abscess, and the spot where that abscess has a tendency to open, as will be more fully explained hereafter, when I come to treat of ulceration."

The better to illustrate the use of the adhesions produced in consequence of this inflammation, Mr. Hunter contrasts it with the erysipelatous. He illustrates this by relating a very extraordinary case, prefaced with the following observations:

"When the erysipelatous inflammation takes place," says he, "the matter gets very freely into the surrounding and sound cellular membrane, and then diffuses itself almost over the whole body; while, in another kind of constitution, the adhesive inflammation would have been produced, to have prevented its progress.

"The adhesive inflammation takes place in consequence of accidents, when it is impossible it should ever produce the same good effects, such as in wounds which are not allowed or cannot heal by the first intention; for instance, a stump after amputation, and many other wounds; but it is one of those fixed, and invariable principles of the animal machine, which upon all such irritations, uniformly produces the uniting process, though like many other principles in the same machine, these effects are perhaps not so much required; so that although a wound is not allowed to heal, or cannot heal by means of the adhesive inflammation, yet the surrounding parts go through the common consequences of being wounded, and the surrounding cells are united, as was described when I treated of union by the first intention. It first throws out the blood, as if the intention was to unite the parts again; the newly cut or torn ends of the vessels, however, soon contract and close up, and then the discharge is not blood, but a serum with the coagulating part of the blood, similar to that which is produced by the adhesive state of inflammation, so that they go through the two first processes of union; therefore the use of the adhesive inflammation does not appear so evidently in these cases, as in spontaneous inflammation; however,

in case of wounds which are allowed to suppurate, it answers the great purpose of uniting the cells at the cut surface from their being simply in contact with each other, as has been described, which confines the inflammation to that part, without which the irritation arising from this state of imperfection might have been communicated from cell to cell, and proceed farther than it commonly does. The cut vessels, by this means, are also united, which hinders the progress of inflammation from running along their cavities, as we find sometimes to be the case in the veins of a wounded surface, where this inflammation has not taken place. From every thing which has been said, it must appear, that all surfaces which are suppurating in consequence of this inflammation, have their basis in that state of the adhesive inflammation, which very nearly approaches to suppuration; and this inflammation is less and less, as it recedes further from the suppurating centre."

Mr. Hunter next treats of that species of inflammation, to which he gives the name of *suppurative*. We shall chiefly notice such parts of this chapter as are of a practical tendency.

"When the adhesive inflammation," says he, "is not capable of resolution, and has gone as far as possible to prevent the necessity of suppuration, especially in those cases that might have admitted of resolution, as in spontaneous inflammations in general, where there has neither been an exposed laceration of the solids, nor, as beforementioned, loss of substance, but where the natural functions of the part have only been so deranged that it was unable to fall back into a natural and sound state again; or, secondly, where it was a consequence of such accidents, as the effects of the adhesive could not in the least prevent (as in wounds that were prevented from healing by the first or second intention); then under either of these two circumstances suppuration takes place.

"The immediate effect of suppuration, is the produce of the pus, from the inflamed surface, which appears in such cases or under such circumstances to be a leading step to the formation of a new substance, called granulations, which granulations are the third method in the first order of parts, of restoring those parts to health; but upon all internal canals, suppuration is certainly not a leading step to granulations, which will be explained hereafter.

"The same theory of the adhesive inflammation respecting the vessels is, I believe, applicable to the suppurative; for when suppuration is the first, we have the vessels in the same state as in the adhesive when it happens, but their dispositions and actions must have altered, there being a great difference in their effects.

"This is so much the case, that the true inflammatory disposition and action almost immediately ceases upon the commencement of suppuration, and although the vessels may be nearly in the same state, yet they are in a much more quiescent mood than before, and have acquired a new mode of action."

Mr. Hunter eſtabliſhes as an invariable fact, that "no ſuppuration takes place which is not preceded by inflammation;" that is to ſay, that no *pus*, properly ſuch, is formed but in conſequence of it.

"The irritation," he obſerves, "which is immediately the cauſe of ſuppuration, is the ſame, from whatever cauſe it may proceed, ſimilar to that which produces the adheſive ſtage; it is a ſimilar proceſs going through the ſame ſtages, and is attended with nearly the ſame circumſtances, whether it takes its riſe from external violence, the conſtitution, or a diſpoſition in the part, if all other circumſtances are equal; however, it is not ſo general in its cauſes as the adheſive, for the thickening proceſs will take place in many diſeaſes, where true ſuppuration is not admitted; as in ſome ſcrofulous caſes, ſome venereal, and alſo cancers; ſuppuration, therefore, depends more on the ſoundneſs of parts than the adheſive, and this is ſo much the caſe, that we can, in ſome degree, judge of a ſore ſimply by its diſcharge.

"It appears very difficult to give a true and clear idea of the whole chain of cauſes leading to ſuppuration. The immediate ſtate of parts, which may be called the immediate cauſe, I conceive to be ſuch as cannot carry on its uſual functions of life, and which ſtate of parts I have called the ſtate of imperfection, let the cauſe of that ſtate be what it will; we have ſhown that irritation ſimply is not always ſufficient, it often only brings on the adheſive ſtage, which is in moſt caſes intended to prevent the ſuppurative, as has been obſerved.

"It is a curious fact, to ſee the ſame mode of action producing two ſuch contrary effects, and each tending to a cure; the firſt producing from neceſſity the ſecond, and being alſo ſubſervient to it. Violence done to parts is one of the great cauſes of ſuppuration; but we have already remarked that violence ſimply does not always produce this inflammation; that it muſt be a violence followed by a prevention of the parts performing their cure in a more ſimple way, viz. a reſtoration of the ſtructure, ſo as to carry on the animal functions of the part, or in other words, a prevention of union by the firſt or ſecond intention, or attended with this circumſtance of the parts being kept a ſufficient time in that ſtate into which they were put by the violence; or what is ſomething ſimilar to this, violence attended with death in a part, ſuch as in many bruiſes, mortifications, ſloughs in conſequence of cauſtics, &c. which, when ſeparated, have expoſed internal ſurfaces.

"Various have been the opinions on this ſubject; and as every violence committed from without, under the circumſtances before mentioned, is expoſed more or leſs to the ſurrounding air, the application of this matter to internal ſurfaces has generally been aſſigned as a cauſe of this inflammation; but air certainly has not the leaſt effect upon thoſe parts; for a ſtimulus would ariſe from a

wound were it even contained in a vacuum. Nor does the air get to the parts that form circumſcribed abſceſſes ſo as to be a cauſe of their formation, and yet they as readily ſuppurate in conſequence of inflammation as expoſed ſurfaces."

"If it was neceſſary that air ſhould be admitted in order for ſuppuration to take place, we ſhould not very readily account for ſuppuration taking place in the noſe from a cold, as this part is not more under the influence of air at one time than at another; nor is the urethra in a gonorrhœa affected by the air more at that time than at any other; theſe parts being at all times under the ſame circumſtances with reſpect to air, therefore there muſt be another cauſe.

"Suppuration does not ariſe from the violence of the action of the parts inflamed, for that circumſtance ſimply rather tends to produce mortification; and we ſee that in the gout, which does not ſuppurate, there is often more violent inflammation than in many others that do; all internal canals likewiſe ſuppurate with very ſlight inflammation, when not in an irritable habit; but if of a very irritable diſpoſition, the action will almoſt exceed ſuppuration, and by its becoming milder, ſuppuration will come on.

"But if we ſuppoſe the cauſe of inflammation to be a diſpoſition in the part for ſuch actions, without the parts themſelves being either diſeaſed, or in ſuch ſtate to be ſimilar to the deſtruction or alteration of their texture, this inflammation then may ariſe from a vaſt variety of cauſes, with which we are at preſent totally unacquainted; nay, which we do not perhaps even ſuſpect: and this laſt opinion, upon a ſlight view, would ſeem to be the moſt probable, becauſe we can frequently put back theſe ſpontaneous inflammations, which would not be the caſe if they came on from the deſtruction of a part, or any thing elſe, whoſe ſtimulus was ſimilar to it; for no ſuch thing can be done with wounds, if they are not ſoon united by the firſt intention, they muſt ſuppurate: however, this argument is not concluſive, for we can prevent ſuppuration in thoſe ariſing from accident, by uniting them by the ſecond intention, which is preventing ſuppuration, by acting as a kind of reſolution.

"Although ſuppuration is often produced without much viſible violence of action in the part, yet when it is a conſequence of a healthy inflammation, we find in general that the inflammation has been violent.

"It is always more violent than in its preceding inflammation; and in ſuch caſes it would appear to be little more than an increaſed action, out of which is produced an entire new mode of action, and which of courſe deſtroys the firſt.

"It is from this violence that it produces its effects ſo quickly; for the inflammation which is capable of producing quickly ſo great a change in the operations of the parts, as ſuppuration, muſt be

violent; becauſe it is a violence committed upon the natural actions and ſtructure of the parts.

"This inflammation will alſo be more or leſs, according to the violence of the cauſe producing it, compared with the ſtate of the conſtitution and parts affected.

"The inflammation which precedes ſuppuration is much more violent in thoſe caſes where it appears to ariſe ſpontaneouſly, than when it ariſes from any injury done by violence. A ſuppuration equal in quantity to that from an amputation of the thigh, ſhall have been preceded by a much greater inflammation than that which is a conſequence of the amputation.

"This inflammation would ſeem to vary ſomewhat in its effects according to the exertion of that power during its progreſs; for in proportion to its rapidity the cauſe is certainly more ſimple, and its termination and effects more ſpeedy and ſalutary; and this idea agrees perfectly with inflammation in conſequence of accidents, for there it runs through its ſtages more rapidly, and with leſs inflammation; neceſſity appears to be the leading cauſe here."

Mr. Hunter ſuggeſts that this is the caſe even in thoſe parts which have a tendency to ſlow and ſpecific diſeaſes; as in the breaſts of women, or the teſticles in males. "For if theſe parts inflame quickly, the effects will be more ſalutary than if they inflamed ſlowly. In other words, thoſe parts are capable of being affected by the common ſuppurative inflammation, which in moſt caſes terminates well; perhaps the ſpecific inflammation is ſlow in its progreſs and operation, and ſuch ſlowneſs marks it to be an inflammation of ſome ſpecific kind."

The introductory matter on ſuppurative inflammation concludes with ſome inſtances to ſhew that ſuppuration takes place with greater facility in internal canals, than in internal cavities.

The *ſymptoms of the ſuppurative inflammation* are next very ably deſcribed. It contains many ingenious reflections, though the author's reaſoning is not in all inſtances ſo clear as we could wiſh.

"The effect of inflammation," ſays he, "appears to be the producing of the ſuppurative diſpoſition, or that ſtate of a part which diſpoſes it to form pus. In doing this the inflammation ſeems firſt to be carried to ſuch a height as to deſtroy that ſtate of the parts on which itſelf depends, the conſequence of which is, that they loſe the inflammatory diſpoſition, and come into that which fits them for forming pus.

"It ſeems to be a fixed and moſt uſeful law in the animal œconomy, that in ſpontaneous inflammation, when it has either deſtroyed the natural functions of parts, ſo much as to prevent their returning by a retrograde motion, as it were, to the ſtate from whence they ſet out, or where the firſt cauſe was a deſtruction of the natural functions, as an expoſure of internal ſurfaces, that they form a diſpoſition to the ſecond method of cure. That the diſpoſi-

tion for ſuppuration is very different from the actual ſtate of inflammation, though produced by it, is proved by a variety of obſervations; for no perfect ſuppuration takes place till the inflammation is gone off; and as the inflammation ceaſes, the diſpoſition to ſuppuration gradually comes on. If too by any peculiarity in the conſtitution or inflammation by which it is continued, or if by any accident an inflammation is brought on a healthy ſore, the diſcharge and other appearance become the ſame as they were when the part from whence they aroſe was firſt in an inflamed ſtate, very different from thoſe obſerved when it was arrived at the ſtate of a kind of ſuppuration.

The *treatment* required when *ſuppuration muſt take place* is highly important. In what relates to this caſe Mr. Hunter ſays, "the practice will be to moderate the inflammation, if neceſſary, but not with a view to *prevent ſuppuration*; for if the powers are very great, and the violence committed very conſiderable, the inflammation will probably be very violent; and if it ſhould have equal effects on the conſtitution, which will be in proportion to the quantity of ſurface inflamed, then certain conſtitutional means of relief will be neceſſary, ſuch as bleeding, purging, regimen, and perhaps producing ſickneſs; becauſe, while that inflammation continues to have effects upon the conſtitution, the ſuppuration which takes place will not be ſo kindly, as it would otherwiſe be; but if the conſtitution is of the irritable kind, which will be generally known by the inflammation, the ſame practice as mentioned above is neceſſary; in ſhort, whatever is to be the conſequence, whether reſolution or ſuppuration, the irritability and the too great action of the veſſels, whether ariſing from too great powers, or too great action with ſmall powers, are to be corrected or removed, as they in all caſes counteract ſalutary operations."

If the conſtitution is much affected, the author recommends neutral mixtures and gentle ſudorifics, and occaſionally opium, except in conſtitutions where the latter increaſes irritation.

"Freſh wounds," ſays he, "conſidered ſimply as wounds, are all of the ſame nature, and require one uniform treatment; the intention being to put them into that ſituation in which they can ſuppurate with moſt eaſe to themſelves; and the firſt dreſſings commonly remain till ſuppuration comes on, unleſs ſome peculiarity from the ſituation of parts, or other collateral circumſtances, ſhould make it neceſſary to remove the dreſſings or vary the treatment.

"The difference between one wound and another, with reſpect to the nature of the part wounded, will vary very much; ſome will have ſmall veſſels wounded that cannot be conveniently got at in order to tie them up, yet ſhould be ſtopt from bleeding, which can be done by the mode of dreſſing, and therefore require dreſſings ſuitable to this circumſtance alone.

"Wounds opening into cavities where peculiarities of the contained parts are joined with the injury done to them by the accident, will require a ſuitable mode of dreſſing; the influence too that a ſimple wound in the containing parts may have upon thoſe in the cavity, as a wound into the belly, thorax, joints, ſkull, &c. will oblige the ſurgeon to vary the mode of dreſſing from that of a ſimple wound. While many wounds will require being kept open for fear of uniting again, in order to anſwer ſome future purpoſe, as the wound made into the tunica vaginalis teſtis, for the radical cure of the hydrocele; others may require attention being paid to them before ſuppuration comes on, and therefore ſhould be ſo dreſſed as to admit of being ſoon and eaſily removed, to examine the parts occaſionally as the ſymptoms ariſe. This ought to be the caſe in wounds of the head, attended or not attended with fracture of the ſkull. But whatever mode of application may be thought neceſſary to anſwer the various attending circumſtances, yet as they are all wounds which are to come to ſuppuration, one general method is to be followed reſpecting them all, as far as thoſe peculiarities will allow.

"The application which has been made to wounds for ſome years paſt in this country, has been in general dry lint; what brought this application into common practice, moſt probably was its aſſiſting in ſtopping the hemorrhage; and as moſt wounds are attended with bleeding, it became univerſal; but as it became univerſal, it loſt the firſt intention, and became ſimply a firſt dreſſing."

Mr. Hunter here obſerves, that if all wounds that are to ſuppurate are firſt attended with inflammation, and therefore are ſo far ſimilar to ſpontaneous inflammations which are to ſuppurate, how contradictory muſt this mode of treatment be to common practice, when ſpontaneous inflammation has already taken place. "Where is the difference," ſays he, "between an inflammation with a wound, and one without? And alſo, what ſhould be the difference in the application to a part that is to inflame (while that application is made to the part) and one applied to an inflammation which has already taken place?"

"Wounds that are to ſuppurate," continues the author, "are firſt to go through the adheſive and ſuppurative inflammations. Theſe inflammations in a wound are exactly ſimilar to thoſe ſpontaneous inflammations which ſuppurate and form an abſceſs, or thoſe inflammations which ulcerate on the ſurface, and form a ſore.

"The applications to theſe which are now in practice, I have formerly obſerved, are poultices and fomentations; theſe, however, appear to be applied without much critical exactneſs or diſcrimination, for they are applied before ſuppuration has taken place, and where it is not intended it ſhould take place; they are applied to inflammations where it is wiſhed they ſhould ſuppurate; and applied after ſuppuration has taken place. Now, with reſpect to ſuppura-

tion itſelf, abſtracted from all other conſiderations, the indication cannot be the ſame in all of thoſe ſtates; but if poultices and fomentations are found to be of real ſervice in thoſe two ſtages of the diſeaſe, then there muſt be ſomething common to both, for which they are of ſervice, abſtracted from ſimple ſuppuration. I alſo formerly obſerved, that poultices were of ſervice when the inflammation had attacked the ſkin, either of itſelf, or when an abſceſs had approached ſo near that the ſkin had become inflamed, and that this ſervice conſiſted in keeping the ſkin ſoft and moiſt. This appears to me to be the uſe of a poultice in an inflammation, either before ſuppuration or after, as inflammation ſtill exiſts, till it is opened; for inflammation is neceſſary in an abſceſs, while it is making its approaches to the ſkin, which I have called the ulcerative, and then, and only then, it begins to ſubſide; it is therefore ſtill proper, in as much as it is of ſervice to inflammation; ſo far, therefore, the practice is right and conſiſtent, as the firſt reaſon exiſts through the whole; but when applied to inflamed parts, which are meant not to ſuppurate, the reaſoning or principles upon which ſurgeons apply it muſt fail them, although the application is ſtill very proper.

"If my firſt propoſition is juſt, viz. that wounds which are allowed to ſuppurate are ſimilar to inflammations that are alſo to ſuppurate; then let us ſee how far the two practices agree with this propoſition. Lint, I have obſerved, is applied to a freſh wound, which is to inflame; and the ſame lint is continued through the whole of the inflammation till ſuppuration comes on, becauſe it cannot be removed. Lint, conſidered ſimply as an application to freſh wounds which are to inflame, is a very bad one, for it more or leſs adheres to the ſurface of the wound, by means of the extravaſated blood; hence it becomes difficult of removal, and often ſhall remain in ſores for months, being interwoven with the granulations, eſpecially when applied to the ſurface of circumſcribed cavities, ſuch as the tunica vaginalis teſtis, after the operation for the hydrocele; however, this is not always the greateſt inconvenience, the circumſtance of its being loaded or ſoaked with blood, ſubjects it to become extremely hard when it dries, which it always does before the ſeparation takes place, which ſeparation is only effected by the ſuppuration. In this way it becomes the worſt dreſſing poſſible for wounds."

Mr. Hunter conſiders a poultice the beſt application to an inflamed part, and alſo to a freſh wound, as it keeps the part ſoft and moiſt, and is eaſily removed.

"The ſame medical advantage," he ſays, "is gained here, as when it is applied to an inflamed part; but although it had not theſe advantages, yet the circumſtance of being eaſily removed is much in its favour, eſpecially when compared to dry lint.

" But a poultice, from other circumſtances, cannot at all times and in all places be conveniently applied.

" To preſerve the above properties, it is neceſſary there ſhould be a maſs, much too large for many purpoſes; but if poultices can be uſed with tolerable convenience, they are the beſt applications. When they cannot be applied with eaſe, I ſhould ſtill object to dry lint, and would therefore recommend the lint to be covered with ſome oily ſubſtance, ſo that the blood ſhall not entangle itſelf with the lint, but may lie ſoft, and come eaſily off.

" This mode of dreſſing ſhould be continued for ſeveral days, or at leaſt till fair ſuppuration comes on, and when that has taken place, then dry lint may be with great propriety uſed, except the ſore is of ſome ſpecific kind, which is ſeldom the caſe in freſh wounds; for accidental wounds ſeldom happen in ſpecific diſeaſes; and a wound in conſequence of an operation ſhould not be ſpecific, becauſe the ſpecific affection (if there is any) ſhould have been removed by the operation, and ſhould therefore be a wound in the ſound part; as after an amputation of a ſcrofulous joint, or the extirpation of a cancerous breaſt. Or if they take on ſome ſpecific diſpoſition afterwards, then they muſt be dreſſed accordingly, as will be explained hereafter."

Mr. Hunter warns the ſurgeon againſt making poultices too thin or of ſtale bread, which is not ſufficiently tenacious ſo as to be kept in one connected maſs. He recommends lintſeed ſtirred into boiling water, and (improperly, we think) ſome *ſweet-oil.*

" The kind of wound," ſays he, " to which the above application is beſt adapted, is a wound made in a ſound part, which we intend ſhall heal by granulation. The ſame application is equally proper, where parts are deprived of life, and conſequently will ſlough. It is therefore the very beſt dreſſing for a gun-ſhot wound, and probably for moſt lacerated wounds. For lint applied to a part that is to throw off a ſlough, will often be retained till that ſlough is ſeparated, which will be for eight, ten, or more days."

We are told " that in the treatment of wounds that are to ſuppurate, it is in one view of the ſubject right to allow the parts to take their natural and ſpontaneous bent;" but in another a conſiderable degree of utility ariſes from bringing the ſkin as much as poſſible over the wound, and keeping it there; " for in the time of inflammation the parts will adhere or unite in this ſituation, by which means the ſore will be leſs than it otherwiſe would." Mr. Hunter conceives that this practice, when begun, ſhould be perſiſted in for ſome time, for fear the adheſions may not be able to ſtand till the granulations can aſſiſt in completing the union.

" It happens in many wounds," continues he, " both from accident and operations, that part of the wound may with great propriety be healed by the firſt intention; ſuch as in many accidents on the head, when a part of the ſcalp has been torn off, on the face,

&c. as alſo after many operations, eſpecially where the ſkin is looſe, as in the ſcrotum; or where the ſkin has been attended to in the time of the operation, as in ſome methods of amputation, extirpation of breaſts, &c. a part of the ſaved ſkin, &c. may be made to unite to the parts underneath by the firſt intention, and therefore only part of the wound allowed to ſuppurate. In all ſuch caſes, a proper contracting or ſuſtaining bandage may be applied with great advantage; even ſtitches may be uſed with great propriety, as was recommended in the healing of wounds by the firſt intention."

Under *treatment of the inflammation* when *ſuppuration* has taken place, the author aſſerts from his own experience, that ſuppuration does certainly ſometimes ſtop, after having begun, and that this ſhows there is a principle in the animal œconomy of diſeaſes, from which the machine is capable of producing this conſequence.

Here Mr. Hunter thinks it expedient to introduce the following remarks: "I have formerly obſerved," ſays he, "that the inflammation goes off often without producing ſuppuration; and I have alſo mentioned inſtances of ſuppuration going off without the parts having produced granulations, and then the parts fall back into the adheſive ſtate, and the matter being abſorbed, they are left in nearly the ſame ſtate as before the inflammation came on; as a preſumptive proof of this, in many of the large cavities, which have been allowed to inflame and ſuppurate (by having been opened), we find them often doing well, without ever forming granulations; and that ſuppuration generally goes off; and I do not believe ever fall back into the adheſive ſtate, ſo as to unite the parts, but the parts reſume their original and natural ſtate or diſpoſition, and no adheſions are formed; this appears ſometimes to happen in caſes of the empyema after the operation has been performed: I have ſeen caſes where wounds had been made into the cavity of the thorax, where there was every reaſon to ſuppoſe the whole cavity was in a ſtate of ſuppuration, and yet thoſe patients got well; I can hardly ſuppoſe that in theſe caſes the parts had granulated and united in the cure, as the cellular membrane does; becauſe I have ſeen many ſimilar caſes, where the patients have died, and no granulations have been found: and I have ſeen caſes of the hydrocele attempted to be cured radically by the cauſtic; when the ſlough came out, ſuppuration came on; but the orifice healing too ſoon, ſuppuration has ceaſed, and the cure was thought to be completed; but a return of the diſeaſe has led to another attempt, and by laying open the whole ſac, it has been found that the tunica vaginalis was perfectly entire. In ſuch the fluid was a mothery ſerum. I have ſeen abſceſſes go back in the ſame manner: but I believe that this proceſs is more common to ſcrofulous ſuppurations than any other; and I believe to the eryſipelatous. I have ſeen joints heal after having ſuppurated and been opened, without having produced granulations, leaving a kind of joint, even when the cartilages have exfoliated from the ends of the

bones, which was known by the grating of the two ends of the bones on one another."

The author aſſerts that he has ſeen buboes cured by vomits, after ſuppuration had been much advanced; and that it is no uncommon termination of ſcrofulous impoſthumes: "but in ſcrofulous abſceſſes we very ſeldom find inflammation; this proceſs appears to be a leading circumſtance in ulceration, which is the very reverſe of union. Even in ſuperficial ſores, which are the moſt likely to continue ſuppuration, if excited, we find by allowing them to ſcab, when they will admit of it, that the act which admits of ſcabbing is the reverſe of ſuppuration, and it ceaſes; however, it is a proceſs which the animal œconomy does not readily accept of, and our powers in producing this effect are but very ſmall: if theſe powers could be increaſed by any means, it would be a ſalutary diſcovery; becauſe ſuppuration itſelf, in many caſes, proves fatal; for inſtance, ſuppuration of the brain and its membranes; of the thorax and its contents, as well as of the abdomen and its contents; in ſhort, ſuppuration of any of the vital parts often kills of itſelf, ſimply from the matter being produced: but this practice will by ſome be forbid in many caſes of ſuppuration; for it is ſuppoſed this very ſuppuration is a depoſit of matter or humours already formed in the conſtitution; but it is to be hoped that time and experience will get rid of ſuch prejudices."

Mr. Hunter's injunctions as to the treatment when ſuppuration cannot be ſtopped or reſolved, are the following: "How far ſuppuration can be increaſed by medicine or application," ſays he, "I do not know; but attempts are generally made; and thence we have ſuppurating cataplaſms, plaſters, &c. recommended to us, which are compoſed of the warmer gums, ſeeds, &c. but I doubt very much if they have conſiderable effect in this way; for if the ſame applications were made to a ſore, they would hardly increaſe the diſcharge of that ſore, probably rather decreaſe it. However, in many caſes, where the parts are indolent, and hardly admit of true inflammation, in conſequence of which a perfect ſuppuration cannot take place; by ſtimulating the ſkin, a more ſalutary inflammation may be produced, and of courſe a quicker ſuppuration: but in the true ſuppuration, where inflammation preceded it, I believe it is hardly neceſſary to do any thing with reſpect to ſuppuration itſelf. And yet, from experience, I believe theſe applications have been found to bring the matter faſter to the ſkin, even in the moſt rapid ſuppurations, which was ſuppoſed to be an increaſed formation of matter; but it can only be in thoſe caſes where the inner ſurface of the abſceſs is within the influence of the ſkin. This effect ariſes from another cauſe or mode of action being produced, than that of quickening ſuppuration, which is the haſtening on of ulceration. I have mentioned that ulceration was an effect of, or at leaſt attended by, inflammation; and, therefore, whatever increaſes that

inflammation, will alſo increaſe the ulceration, which will bring the matter ſooner to the ſkin, without an increaſed formation of matter.

"Poultices of bread and milk are commonly uſed to inflamed parts when ſuppuration is known to have taken place; this application can have no effect upon ſuppuration, excepting by leſſening inflammation, or rather making the ſkin eaſy under it; for we obſerved, that true ſuppuration did not begin till inflammation was abated; but the inflammation muſt have reached the ſkin before poultices can have much effect, for it can only affect that part.

"It may be thought neceſſary that the eaſe of the patient ſhould be conſidered, and we find that fomentations and poultices often produce that effect; we find too, that by keeping the cuticle moiſt and warm, the ſenſitive operations of the nerves of the parts are ſoothed, or lulled to reſt; while, on the contrary, if the inflamed ſkin is allowed to dry, the inflammation is increaſed; and as probably ſuppuration is not checked by ſuch treatment, it ought to be put into practice. As warmth excites action, it is probable, the warmer the fomentation, ſo much the better; and in many caſes the action is increaſed ſo that the patient can hardly bear it."

What follows on *the treatment of abſceſſes* is important and purely practical. Mr. Hunter's intention is to lay down ſuch general ſurgical rules for their treatment, and for many of their conſequences, as will include almoſt every diſeaſe of this kind, conſidered as an abſceſs ſimply. He ſpeaks with great indeciſion concerning the advantage and diſadvantage of large and ſmall openings. Whether this ariſes from his opinion concerning the admiſſion of air, or from his conſidering the lumbar abſceſs as a collection of matter, not ariſing from inflammation, but of ſcrofulous origin, and ſo not to his preſent purpoſe, is not very evident: but it is highly material that the ſurgeon ſhould conſider this point well before he proceeds to make a large inciſion in ſuch caſes. We reſerve for our ſection on the lumber abſceſs what the author offers on this head, and proceed to notice his excellent remarks.

On *collections of matter without inflammation*, "I have hitherto," ſays he, "been deſcribing true ſuppuration, which I have ſaid, I believe is a conſequence only of inflammation, a proceſs generally allowed. Alſo in treating on the cauſe of ſuppuration, viz. inflammation, I hinted, that there were often ſwellings, or thickening of parts, without the viſible or common ſymptoms of inflammation, viz. without pain, change of colour, &c.; and I alſo hinted, in treating of ſuppuration, that there were collections of matter ſomewhat ſimilar to ſuppuration, which did not ariſe in conſequence of the common inflammation; theſe I ſhall now conſider. I conceive all ſuch collections of matter to be of a ſcrofulous nature; they are moſt common in the young ſubject, and ſeldom found in the full-grown or old. It is commonly called matter, or pus, and therefore I chooſe to contraſt true ſuppuration with it. Although

I have termed this ſuppuration, yet it has none of its true characters, any more than the ſwellings, which are the forerunners of it, have the characters of inflammation; and as I did not call them inflammatory, ſtrictly ſpeaking, I ſhould not call this ſuppuration; but I have no other term expreſſive of it.

"Many indolent tumors, ſlow ſwellings in joints, ſwellings of the lymphatic glands, tubercles in the lungs, and ſwellings in many parts of the body, are diſeaſed thickenings, without viſible inflammation; and the contents of ſome kinds of incyſted tumor; the matter of many ſcrofulous ſuppurations, as in the lymphatic glands; the ſuppuration of many joints, viz. thoſe ſcrofulous ſuppurations in the joints of the foot and hand; in the knee, called white ſwellings; the joint of the thigh, commonly called hip caſes; the loins, called lumbar abſceſſes; the diſcharge of the above-mentioned tubercles in the lungs, as well as in many other parts of the body, are all matter formed without any previous viſible inflammation, and are therefore, in this one reſpect, all very ſimilar to one another. They come on inſenſibly; the firſt ſymptom being commonly the ſwellings, in conſequence of the thickening, which is not the caſe with inflammation, for there the ſenſation is the firſt ſymptom.

"Theſe formations of matter, although they plainly approach the ſkin, yet do not do it in the ſame manner as collections of pus. They do not produce readily either the elongating or the ulcerative proceſs, and as the matter was not preceded by the adheſive inflammation, theſe collections are more eaſily moved from their original ſeat in ſome other part, by any ſlight preſſure, ſuch as the weight of their own matter, which I have called abſceſſes in a part, in oppoſition to abſceſſes of a part. When the matter does approach the ſkin, it is commonly by merely a diſtenſion of the part, coming by a broad ſurface, not attended with any marks of pointing."

Having noticed the ſoftneſs of the ſurrounding parts of theſe tumors, and their not being attended with much thickening; the author acquaints us, that, "Such collections of matter are always larger than they would have been, if they had been either a conſequence of inflammation, or attended by it; this is owing to their indolence, allowing of great diſtenſion beyond the extent of the firſt diſeaſe, even moving into other parts; whereas, an abſceſs in conſequence of inflammation, is confined to the extent of inflammation that takes place on ſuppuration, and its rapid progreſs towards the ſkin prevents diſtenſion, and of courſe extenſion of the diſeaſe.

"All thoſe formations of matter, not preceded by inflammation, nor a conſequence of it, are, I believe, ſimilar to each other, having in this reſpect one common principle, *very different from inflammation.* The cancer, although it produces a ſecretion, yet does not produce *pus* till expoſed; it is, therefore, one of thoſe diſeaſes, like the ſcrofula, which does not ſuppurate till inflammation comes on, and even ſeldom then; for true ſuppuration ariſes from inflam-

mation, terminating in a diſpoſition to heal, which is not the caſe with cancer. In the ſcrofulous ſuppuration there is often a like reluctance to heal.

"The *kind of matter* is another diſtinguiſhing mark, between that produced in conſequence of inflammation, and what is formed without it; the laſt being generally compoſed of a curdly ſubſtance, mixed with a flaxy matter: the curdly ſubſtance is, we may ſuppoſe, the coagulating lymph deprived of its ſerum, and the other, or flaky, is probably the ſame, only in ſmaller parts; it looks like the precipitate of animal matter, from an acid or alkali.

"So far theſe productions of matter, in their remote and immediate cauſe, are not in the leaſt ſimilar to that ariſing from common inflammation, nor is the effect, viz. the matter, ſimilar; and to ſhow ſtill further, that ſuppuration is always preceded by inflammation, the very ſurfaces which formed the above matter, immediately produce true matter, when the inflammation comes on, which it always does whenever opened."

As they are not ſimilar in their cauſes, or in their modes of production, Mr. Hunter thinks it neceſſary next to examine "how far they are ſimilar in their firſt ſteps towards a cure."

"All parts," ſays he, "which form matter of any kind, viz. whether in conſequence of inflammation or otherwiſe, muſt go through ſimilar proceſſes to produce the ultimate effect or cure. The firſt ſtep, in either, is the evacuation of this matter; for till this is effected, nature cannot purſue the proper means towards a cure; and if opened, the ſecond ſtep is granulation, and the third cicatrization. To accompliſh the evacuation of the matter, there are two modes; one is the abſorption of the matter, which is very common in the ſcrofula, or thoſe productions of matter, not preceded by inflammation. This produces no alteration in the part, except that it gradually creeps into a ſound ſtate, the parts uniting again that had been ſeparated by the accumulation of the matter; it produces alſo no alteration in the conſtitution. Abſorption, however, ſeldom takes place in ſuppuration, which is the conſequence of inflammation. The other mode of diſcharging this matter is either by opening the abſceſs, in order to allow it to paſs out, or by allowing ulceration to take place from the inſide to produce its eſcape; and this proceſs, in the preſent caſe, having peculiarities different from thoſe ariſing from inflammation, it is neceſſary they ſhould be underſtood. Ulceration, in conſequence of ſuppuration ariſing from inflammation, is very rapid, eſpecially if the ſuppuration is ſo likewiſe; but ulceration, in conſequence of matter being formed, which is not the effect of inflammation, is extremely ſlow; it will remain months, even years, before the parts have completely given way; they commonly come to the ſkin by a broad ſurface, and not pointing like a circumſcribed abſceſs in conſequence of inflammation; ſo far are theſe two different."

The effects which theſe formations of matter have on *the conſtitution*, come next under Mr. Hunter's conſideration; but we propoſe to introduce this ſubject, and alſo what is ſaid on *ulcerative inflammation*, in another place. As we have given ſo extended and hypothetical a view of the ſubject of inflammation, in which many points of practice, recommended by the ingenious author, are at variance with received opinions, we ſhall conclude this chapter with a review of what has long been the general practice of ſurgeons, in the treatment of inflammation and gangrene, leaving our readers at liberty to exerciſe their judgment.

During the firſt ſtage of inflammation, we ought, for the moſt part, to endeavour to *reſolve it*, or prevent the ſuppuration. Yet ſome caſes muſt be excepted. For inſtance, thoſe inflammatory ſwellings which ſometimes occur in fevers, or ſucceed to them, ought always to be brought to ſuppuration; and it might be very dangerous to attempt a reſolution of them. In ſwellings of a ſcrophulous nature, it is perhaps beſt to do nothing at all, either with a view to reſolve or ſuppurate. Thus it might be pernicious to make uſe of repellent applications, at the ſame time that it is by no means adviſable to promote their ſuppuration; the cure of ſuch ſwellings, when opened, proving always very troubleſome; while at the ſame time it is known that ſuch ſwellings may remain for a very long time without any riſk to the patient. In the lues venerea, too, as we are poſſeſſed of a certain antidote for the diſorder, it is beſt not to attempt the ſuppuration of any buboes which may appear; as the cure of them, when opened, very often proves extremely troubleſome; and as their being opened cannot contribute any thing towards their cure.

Where the inflammation is but beginning, and the ſymptoms are not ſo violent as to affect the general ſyſtem, topical remedies, with a due attention to regimen, often anſwer in reſolving them. The firſt thing to be attended to in the caſe of every inflammation, is the removal of the exciting cauſes, which either have brought on the inflammation originally, or which may continue it after it is begun. Such are extraneous bodies in wounds, pieces of fractured bones, luxations, &c. Of all the various applications for an inflamed part, thoſe of a ſedative nature are chiefly to be depended upon; and, next to theſe, emollients. Of the former kind we may conſider all the aſtringent ſalts, diſſolved in vinegar; together with vinegar itſelf, which generally acts alſo as a ſedative. Among the latter we may place fomentations and poultices, as alſo the ſoft ointments made with ſedative ingredients.

The following are uſed at the different London hoſpitals, and by ſome private practitioners:

(No. 14.) ℞ Ammoniæ muriatæ unc. ſs.
Aceti
Spiritus vinoſi rectificati ſing. lib. j. Fiat lotio.

(No. 15.) ℞ Aquæ lithargyri acetati drach. ij.
Aquæ diſtillatæ lib. ij.
Spiritus vinoſi rectificati unc. j. miſce. Fiat lotio.

(No. 16.) ℞ Spiritus camphorati drach ij.
Aquæ lithargyri acetati drach. j.
Aquæ diſtillatæ lib. j.

The mixture of theſe is to take place in the order they are ſet down, otherwiſe the camphor will be ſeparated. This lotion is of conſiderable uſe in topical inflammations, thoſe eſpecially which are ſuſpected to have a tendency to eryſipelas. The following ſpirituous lotion is alſo proper in theſe caſes:

(No. 17.) ℞ Spiritus vinoſi rectificati unc. iv.
Aquæ calcis lib. ſs. miſce.

(No.* 17.) ℞ Zinci vitriolati drach. ſs.
Aquæ diſtillatæ lib. ſs. miſce.

This ſolution is now generally employed inſtead of the preparations of lead, which are pernicious to health. At Guy's Hoſpital it is uſed in the proportion of ten grains to half a pint.

When we ſpeak of ſedative medicines, however, it muſt not be underſtood that all of that claſs are to be uſed indiſcriminately. Thus opium, though one of the moſt powerful of all ſedatives, yet as its application, externally, to the human body, is always attended with ſome degree of irritation, however uſeful it may at times be found in ſome particular ſpecies of inflammatory diſorders, will never, probably, as an external application, become of general uſe in theſe caſes. Warm emollient fomentations even, though powerful ſedatives, as tending more effectually to remove tenſion and pain than perhaps any remedy, are frequently found to be improper where a reſolution is to be wiſhed for. Their conſtant effect is, either to bring the ſwelling to a ſuppuration, or to relax the parts in ſuch a manner as to render the removal of the diſorder always exceedingly tedious.

Mr. Bell recommends the preparations of lead as proper applications, in caſes of external inflammation, where we wiſh for a reſolution. The beſt method of applying it, he ſays, is in the form of a watery ſolution; and he gives the following formula:

(No. 18.) ℞ Ceruſſæ acetatæ unc. ſs.
Aceti unc. iv.
Aquæ diſtillatæ lib. ij.

The addition of vinegar renders the ſolution much more complete than it otherwiſe would be; and without it indeed a very conſiderable proportion of the lead generally ſeparates and falls to the bottom.

Mr. Bell obſerves, that in making uſe of this ſolution in caſes of inflammation, as it is of conſequence to have the parts affected kept conſtantly moiſt with it, cataplaſms prepared with it and crumb of bread, in general anſwer that intention exceedingly well. But

when the inflamed part is ſo tender and painful as not eaſily to bear the weight of a poultice, which is frequently the caſe, pieces of ſoft linen moiſtened with the ſolution anſwer the purpoſe tolerably well. Both ſhould be applied cold, or at leaſt with no greater warmth than is merely neceſſary for preventing pain or uneaſineſs to the patient: they ſhould be kept almoſt conſtantly to the part, and removed always before turning ſtiff or hard.

When the tenſion and irritation on the ſkin are conſiderable, emollients are often attended with very great advantage: the parts affected being, in ſuch a ſtate of the diſorder, gently rubbed over with any of the mild embrocations two or three times a-day, the tenſion, irritation, and pain, are often very much relieved, and the diſcuſſion of the tumor thereby greatly promoted. The following are employed at the hoſpitals:

(No. 19.) ℞ Saponis mollis vulg. ℥j.
Spiritus vinos. ten. ℥iv.
Fiat ſolutio.

(No. 20.) ℞ Solutionis ſaponis (ut ſupr.)
Aquæ ammon. acetat. ſing. ℥ij.
Miſce fiat embrocatio.

(No. 21.) ℞ Aq. ammon. acetat. ℥ij.
Sp. vinos. rectif. ℥j. Miſce.

Or the following liniment will anſwer in ſome caſes:

(No. 22.) ℞ Solutionis ſaponis ℥ij.
Aq. litharg. acet. ℥j. Miſce.
Fiat linimentum.

When the part affected with inflammation is not very tender, or lies deep, applications of vinegar are often had recourſe to with conſiderable advantage: the moſt effectual form of uſing it ſeems to be by way of cataplaſm, made with the ſtrongeſt vinegar and crumbs of bread. In ſuch caſes, an alternate uſe of this remedy, with the ſolution of vitriolated zinc, has produced more beneficial effects than are commonly obſerved from a continued courſe of any one of them.

At the ſame time that theſe applications are continued, blooding with leeches, or cupping and ſcarifying, as near as poſſible to the part affected, is generally of very great ſervice; and in no caſe of local inflammation ſhould ever be omitted. In all ſuch caſes, the whole body, but more eſpecially the diſeaſed part, ſhould be preſerved as free as poſſible from every kind of motion; and, for the ſame reaſon, the neceſſity of a low cooling diet, in every inflammatory diſorder, appears obvious, as does alſo a total abſtinence from ſpirituous and fermented liquors.

In ſlight caſes of inflammation, a due perſeverance in the ſeveral articles taken notice of, will, in general, be found ſufficient for every purpoſe. But when there is likewiſe a full, hard, or quick pulſe,

with other ſymptoms of fever, general blood-letting becomes neceſſary; the quantity of blood taken away being always to be determined by the violence of the diſorder, and by the age and ſtrength of the patient. Evacuation, however, ſhould never be carried to a greater height than what is merely neceſſary for moderating the febrile ſymptoms; for if ſuppuration ſhould take place after the ſyſtem is too much reduced, its progreſs is thereby rendered much more ſlow and uncertain, nor will the patient be ſo able to bear the diſcharge that muſt enſue upon opening the abſceſs. The uſe of gentle laxatives, together with cooling diaphoretic medicines, are alſo attended with very good effects.

Theſe different evacuations being premiſed, the next object of conſequence is to procure eaſe and quietneſs to the patient; which is often, in inflammatory caſes, of more real ſervice than any other circumſtance whatever. The moſt effectual remedy for this purpoſe is opium; which, when pain and irritation are conſiderable, as in extenſive inflammations very frequently happens, ſhould never be omitted. In large wounds, eſpecially after amputations and other capital operations, alſo in punctures of all kinds, large doſes of opium are always attended with remarkably good effects. In all ſuch caſes, however, opium, in order to have a proper influence, ſhould, as was obſerved, be adminiſtered in very large doſes; otherwiſe, inſtead of proving ſerviceable, it ſeems rather to have the contrary effect; a circumſtance which is perhaps the chief reaſon for opiates in general having been very unjuſtly condemned in every caſe of inflammation.

By a proper attention to the different circumſtances taken notice of, in the courſe of three or four days, and ſometimes in a ſhorter ſpace of time, reſolution of the tumor will in general begin to take place; at leaſt before the end of that period it may, for the moſt part, be known how the diſorder is to terminate. If the heat, pain, and other attending ſymptoms, abate, and eſpecially if the tumor begins to decreaſe, without the occurrence of any gangrenous appearances, we may then be almoſt certain that, by a continuance of the ſame plan, a total reſolution will in time be effected.

But, on the contrary, if all the different ſymptoms rather increaſe; and eſpecially if the tumor grows larger, and ſomewhat ſoft, with an increaſe of throbbing pain; we may then with tolerable certainty conclude, that ſuppuration will take place; and ſhould therefore immediately deſiſt from ſuch applications as were judged proper while a cure was thought practicable by reſolution, and endeavour to aſſiſt nature as much as poſſible in the formation of pus, or what is called *maturation* of the tumor. For this purpoſe there is nothing better than to preſerve a proper degree of heat in the parts. This is commonly done by the means of warm fomentations and cataplaſms; and when theſe are regularly and frequently renewed,

nothing, it is probable, could more effectually anſwer the purpoſe. But in the ordinary manner in which they are applied, by the cataplaſms being renewed only once, or at moſt twice a-day, they muſt often, it is imagined, do more harm than good. For ſo ſoon as the degree of heat they were at firſt poſſeſſed of is diſſipated, the moiſture kept up in them, with the conſequent evaporation which enſues, muſt always render the part a great deal colder than if it had been merely wrapped in flannel without the uſe of any ſuch application.

In order to receive all the advantage of ſuch remedies, the part affected ſhould be well fomented with flannels preſſed out of hot water, or any emollient decoction, applied as warm as the patient can eaſily bear them, continued at leaſt half an hour at once, and repeated four times a day.

Immediately after the fomentation is over, a large emollient poultice ſhould likewiſe be applied warm, and renewed every ſecond or third hour at fartheſt. Of all the forms recommended for emollient cataplaſms, a bread poultice, with a ſmall portion of linſeed meal, is perhaps the moſt eligible; as it not only poſſeſſes all the advantages of the others, but can at all times be more eaſily obtained.

Roaſted onions, garlic, and other acrid ſubſtances, are frequently made uſe of as additions to maturating cataplaſms. When there is not a due degree of inflammation in the tumor, and when it appears probable that the ſuppuration would be quickened by having the inflammatory diſpoſition ſomewhat increaſed, the addition of ſuch ſubſtances may then be of ſervice; but when ſtimulants are neceſſary in ſuch caſes, a ſmall proportion of ſtrained galbanum, or any of the warm gums, diſſolved in the yolk of an egg, and added to the poultices, is a more certain form of applying them. Whenever the inflammation, however, takes place to a proper degree, ſuch ſtimulating ſubſtances never can be neceſſary; and in many caſes, it is apprehended, they may even do miſchief.

In ſuch tumors as, from their being poſſeſſed of little or no inflammation, are commonly ſaid to be of a cold nature, as they are generally indolent, and proceed very ſlowly to ſuppuration, plaſters compoſed of the warm gums are often had recourſe to with conſiderable advantage. In ſuch caſes, they are not only of uſe by the ſtimulus and irritation they occaſion, but by the heat which they tend to preſerve in the part. They become particularly neceſſary when the patient, by being obliged to go abroad, cannot have cataplaſms frequently enough renewed, or ſo conveniently applied; but when ſome ſuch objection does not occur, the latter, for very obvious reaſons, ſhould always be preferred. The following remedies adapted to the caſes of tumor laſt mentioned, are given in the Pharmacopœia Chirurgica:

(No. 23.) ℞ Radicis brioniæ unc. iij.
Florum ſambuci unc. j.
Gummi ammoniaci unc. ſs.
Ammoniæ muriatæ drach. ij.
Spiritus camphorati unc. j.

After boiling the briony and elder flowers till they become tender, they muſt be bruiſed, and the gum ammoniac, previouſly diſſolved in vinegar, muſt be added to them. The muriated ammonia and the camphorated ſpirit are laſtly to be joined, and the whole mixed together into a cataplaſm.

(No. 24.) ℞ Seminum cumini lib. j.
Baccarum lauri
Foliorum ſcordii exſiccatorum
Radicis ſerpentariæ virginianæ ſing. unc. iij.
Caryophyllorum aromaticorum unc. j.

Theſe ingredients are to be powdered and formed into a cataplaſm with thrice their weight of honey.

(No. 25.) ℞ Radicis lillii albi unc. iv.
Caricarum unc. j.
Radicis cepæ vulgaris contuſæ unc. iſs.
Galbani unc. ſs.
Pulveris ſeminis lini q. s.

The lily-roots and figs are to be boiled and bruiſed; the onions are to be afterwards added, and likewiſe the galbanum, previouſly rubbed with the yolk of an egg. This differs little from the old Edinburgh *cataplaſma ſuppurans*, except in the omiſſion of the yellow baſilicon and oil of chamomile.

(No. 26.) ℞ Fomenti communis lib. ij.
Ammonii muriati unc. j.
Spiritus camphorati unc. ij.

Whilſt the fomentation is hot, the ſal ammoniac is to be diſſolved in it, and the camphorated ſpirit added at the inſtant of its being employed.

Dry cupping, as it is termed, that is, cupping without the uſe of the ſcarificator, upon or as near as poſſible to the part affected, is frequently had recourſe to with advantage in promoting the ſuppuration of tumors. It is only, however, in ſuch as theſe laſt mentioned, where there ſeems to be a deficiency of inflammation, that it can ever either be neceſſary or uſeful; but in all tumors of a real indolent nature, and where there is ſtill ſome probability of a ſuppuration, no remedy is more effectual.

Theſe different means, under the circumſtances taken notice of, being continued for a longer or ſhorter time, according to the ſize of the tumor, its ſituation, and other circumſtances, a thorough ſuppuration may in general at laſt be expected.

When *matter is fully formed* in a tumor, it is known by a remiſſion of all the ſymptoms taking place; the throbbing pain, which

before was frequent, now goes off, and the patient complains of a more dull, conſtant, heavy pain: the tumor points at ſome particular part, generally near to its middle; where, if the matter is not encyſted, or deep ſeated, a whitiſh yellow appearance is obſerved, inſtead of a deep red that formerly took place; and fluctuation of a fluid underneath is, upon preſſure, very evidently diſcovered. Sometimes, indeed, when an abſceſs is thickly covered with muſcular and other parts, though, from concurring circumſtances, there can be little doubt of there being even a very conſiderable collection of matter, yet the fluctuation cannot be readily diſtinguiſhed: it does not, however, often happen, that matter is ſo very deeply lodged as not to be diſcovered upon proper examination.

This, however, is a circumſtance of the greateſt conſequence in practice, and deſerves more attention than is commonly given to it. In no part of the ſurgeon's employment is experience in former ſimilar caſes of greater uſe to him than in the preſent; and however ſimple it may appear, yet nothing, it is certain, more readily diſtinguiſhes a man of obſervation and extenſive practice, than his being able eaſily to detect collections of deep-ſeated matter; whilſt nothing, on the contrary, ſo materially affects the character of a ſurgeon, as his having, in ſuch caſes, given an inaccurate or unjuſt prognoſis; as the event, in diſorders of that nature, comes generally at laſt to be clearly demonſtrated to all concerned.

Together with the ſeveral local ſymptoms of the preſence of pus already enumerated, may be mentioned the frequent ſhiverings to which patients are liable on its firſt formation: theſe, however, ſeldom occur ſo as to be diſtinctly obſerved, unleſs the collection is conſiderable, or ſeated internally in ſome of the viſcera.

After the matter is fully formed, and the abſceſs brought to maturity, the only remedy is to *open it*, and give vent to the pus it contains. In many caſes, indeed, nature will do the work, and abſceſſes, when ſuperficially ſeated, will certainly burſt of themſelves: but where the matter lies deep, we are by no means to wait for this ſpontaneous opening; as the pus will acquire an acrimony before it can break through the integuments, which may prove very prejudicial to health. However, it is a general rule not to open abſceſſes till a thorough ſuppuration has taken place; for, when laid open long before that period, and while any conſiderable hardneſs remains, they commonly prove more troubleſome, and ſeldom heal ſo kindly.

In ſome caſes, however, it is neceſſary to deviate from this general rule, and to open them a good deal ſooner; particularly in all ſuch critical abſceſſes as occur in malignant fevers. In like manner, in the plague, we are commonly adviſed to open ſuch tumors, ſo ſoon as they are at all tolerably advanced, and not to wait till they are fully maturated; as, from experience in theſe diſorders, it is found to be of more conſequence, for the removal of the original diſeaſe, to

have a quick discharge of matter produced, than any harm the patient can ever suffer from having a swelling somewhat prematurely laid open.

In abscesses, also, situated on any of the joints, or upon either of the large cavities of the breast and abdomen, and more especially when they seem to run deep, they should always be opened as soon as the least fluctuation of matter is discovered. For, when the resistance is on every side equal, they just as readily point inwardly as outwardly: and the consequence of a large abscess bursting into either of the large cavities, is well known most frequently to prove fatal: an instance of which, in the following case, with very little attention, might have been prevented. A surgeon of eminence, and of very extensive practice, was applied to by a young healthy-looking man, with a large abscess upon the left side of his chest. A fluctuation of a fluid was, upon pressure, very evidently discovered; and it was agreed, by two other practioners who were present, that an opening should be made to give vent to the matter. But the operator, being much engaged in business, could not fix on an earlier period for doing it than the third day from the patient's applying to him: unluckily, however, the patient died suddenly in his bed the night before the abscess was to have been opened. On examining the body, the tumor had disappeared entirely, without any external opening being observable; and, on opening the thorax, it was found to have burst inwardly upon the lungs, and produced immediate suffocation.

In every other circumstance, however, except in the cases alluded to, the rule in opening abscesses is, as was already remarked, to allow a thorough suppuration to take place, before any vent whatever be given to the matter; and it being then determined to lay the collection open, the next question that occurs, is with respect to the manner of doing it. There are three ways of opening an abscess so as to give an outlet to the matter; by caustic, by incision, or by the introduction of a seton.

1. The first is more agreeable to timid patients, who are afraid of the pain of incision, but is attended with some inconveniences which render the method of incision much preferable. *Caustic* acts slowly, and produces a long-continued pain; besides, no kind of caustic has yet been invented, the effects of which can be confined to a certain determinate extent; hence the patient is liable to suffer much unnecessary pain, as the caustics commonly employed are either the lapis infernalis or common caustic. The abscess is to have a slip of adhesive plaster applied to it, with a slit cut in it of a size somewhat less than the opening is intended to be. This slit is to be filled with the caustic reduced into a powder, and wetted to make it act more quickly. It is then to be covered over with a plaster, and the whole secured with a firm compress and bandage. The time necessary for the caustic to make a suffi-

cient opening will depend upon the thickneſs of the ſkin and ſtrength of the cauſtic; but generally it requires ſeveral hours. When we find that an eſchar is made, it is to be ſoftened with any emollient ointment until it can be readily ſeparated; after which the matter is to be diſcharged, and the abſceſs treated as one opened by inciſion.

2. The method of opening abſceſſes by the *knife*, is to make an inciſion of ſuch a ſize as to give free vent to the matter. The opening is to be made in the under part of the tumor, that the matter may paſs readily out. It has been the practice among ſurgeons either to open a large abſceſs from end to end, or at leaſt through two-thirds of its length, but from the bad conſequences which often attend this method, the lateſt practitioners have thought it better merely to give a free diſcharge to the matter, without expoſing the part to the action of the air.

3. The third method, viz. that by the *ſeton*, is now frequently employed. It has the advantage of being attended with little pain, emptying the abſceſs in a gradual manner, and completely preventing the acceſs of the air, which, in the other two methods, is often attended with bad conſequences; and it frequently performs a cure in a much ſhorter time.

There are various inſtruments for introducing the ſeton: it may even be done by a lancet and common probe; but the inſtruments to be found repreſented in Plate 1. fig. 1. and 2. are more frequently employed. One of theſe being threaded with glover's ſoft ſilk, is to be introduced through the upper part of the tumor; but if the blunt one (fig. 2.) be employed, it will be neceſſary to have the aſſiſtance of a lancet; the inſtrument is then to be brought out at the under part of the tumor, and in this way the matter will be allowed to run gradually off. The following caſe deſcribed by Mr. Latta will ſerve to evince the good effects of opening large abſceſſes by the ſeton.

"In June, 1788, I was called to a patient in the country, aged twenty. He complained of ſevere pain along the whole anterior part of the right thigh. On examination a remarkable enlargement was obſerved, and a fluctuation of matter felt, from the trochanter major to the external condyle of the femur, and from the groin to the top of the internal condyle, running, on the under part, in a ſtraight line, from the one condyle to the other. Through the whole anterior part of the thigh, indeed, the fluctuation was very diſtinct. On enquiry, I found that about three months before, after having been fatigued with walking, he felt a pain in the ſuperior and anterior part of the thigh, attended with a ſmall degree of tumefaction. Along with the pain this tumor gradually increaſed, ſo that in eight days it ſpread from the trochanter to the right groin, and deſcended on the anterior part of the thigh about ſix inches. On the application of a poultice

it became ſoft; the pain on the ſuperior part was entirely removed, but the lower part remained inflamed and painful, the tumor ſpreading downwards anteriorly and on both ſides, until, by degrees, it occupied the ſpace above mentioned. I found him much emaciated; his appetite gone; pulſe an hundred and twenty; no regular diſcharge by ſtool, except by injection, for many weeks paſt; and for nine weeks, that is from the firſt appearance of ſoftneſs in the tumor, he had been conſtantly confined to his bed. At the time I ſaw him he could not move in any manner, on account of his extreme debility, and the pain attending every effort to change his poſture.

"In this ſituation, the only means to ſave the patient being evidently to evacuate the matter in as gentle a manner as poſſible, I introduced a ſeton, reaching from near the trochanter obliquely acroſs the thigh, to the moſt depending part, which was immediately on the ſuperior part of the internal condyle. The inferior opening was made about an inch and an half in length, in order to give ſufficient vent to the very great collection of matter. The ſeton was dreſſed in the ordinary manner; a flannel roller, four inches broad, was pinned round the waiſt, and rolled in a ſpiral direction round the thigh, in ſuch a manner as gently to compreſs the whole tumor from the upper to the under part, and then to promote the evacuation of the matter from the inferior orifice, as well as the adheſion of thoſe parts from which it was evacuated. By reaſon of the great diſcharge of matter, it was found neceſſary to draw the cord every twenty-four hours. In no longer ſpace than three days his pulſe decreaſed from 120 to 108; he ſlept four hours without any anodyne; whereas, before the introduction of the ſeton, he had ſeldom ſlept any without that aſſiſtance. In eleven days from the operation he ſeemed to be perfectly well; all the functions being regularly performed as in health; only the debility from what he had formerly ſuffered, and the diſcharge from the ſeton ſtill remained. Both of theſe, however, daily decreaſed; ſo that in ſix weeks from the firſt introduction of the cord it was withdrawn; and in a week afterwards the ſinus was completely healed up in the way above mentioned by the ſmall compreſs and roller."

The uſual mode of *dreſſing an abſceſs* the firſt time is with dry lint. In the courſe of dreſſing, it will be proper to have regard to the ſituation of the abſceſs, and as much as poſſible to make the patient favour the diſcharge by his ordinary poſture; and to this end alſo, the diſcharge muſt be aſſiſted by compreſs and bandage: the compreſs may be made of ſoft old linen, applied according to the nature of the part and the ſeaſon of the year. The frequency of dreſſing will depend on the quantity of diſcharge: once in twenty-four hours is ordinarily ſufficient; but ſometimes two, or perhaps three times, is neceſſary.

In the contents of this, and perhaps of the preceding ſection, the reader may have noticed ſome unavoidable repetitions; but we

gave our reasons for bringing the subject of inflammation under his notice in a more compendious form, which we shall also observe in describing the treatment usually adopted by surgeons in cases of gangrene and mortification.

Sect. II. *Treatment of* Gangrene.

The other consequence of inflammation is gangrene, which may terminate in mortification. When the colour of an inflamed part changes to a dark red, when blisters arise on it containing an ichorous fluid, we know that it has become gangrenous. When it becomes black, flaccid, and insensible, when it loses its heat, and acquires a putrid smell, it has proceeded to complete mortification. A gangrene seldom affects those who enjoy a good habit of body, though, even in them, it may be brought on accidentally by whatever destroys the texture of a part, as contusion, long-continued pressure, or whatever deprives it of its nourishment. In like manner, cold, by putting a stop to the circulation, may produce gangrene, and frequently does so in cold climates. This comes on suddenly, without any pain or previous inflammation; and the patient himself is frequently insensible of it, till he is informed of his situation by some other person.

A defect in the circulation, in extreme old age, frequently occasions mortification in the extremities, and more especially in the toes and feet. The late celebrated Mr. Pott was the first who noticed the distinction to be made between this and other species of mortification, we shall therefore present the reader with his observations in his own words:

"The powers and virtues of the Peruvian bark," says Mr. Pott, "are known to almost every practitioner in physic and surgery. Among the many cases in which its merit is particularly and justly celebrated, are the diseases called gangrene and mortification; its general power of stopping the one, and resisting the other, have made no inconsiderable addition to the success of the chirurgic art; but still there is a particular species even of these, in which this noble medicine most frequently fails: I mean that particular kind, which beginning at the extremity of one or more of the small toes, does, in more or less time, pass on to the foot and ancle, and sometimes to a part of the leg, and in spite of all the aid of physic and surgery, most commonly destroys the patient.

"It is very unlike to the mortification from inflammation, to that from external cold, from ligature, or bandage, or to that which proceeds from any known and visible cause, and this as well in its attack as in its process. In some few instances it makes its appearance with little or no pain; but, in by much the ma-

jority of these cases, the patients feel great uneasiness through the whole foot and joint of the ancle, particularly in the night, even before these parts show any mark of distemper, or before there is any other than a small discoloured spot on the end of one of the little toes.

"It generally makes its first appearance on the inside, or at the extremity, of one of the smaller toes, by a small black, or blueish spot: from this spot the cuticle is always found to be detached, and the skin under it to be of a dark red colour.

"If the patient has lately cut his nails, or corn, it is most frequently, though very unjustly, set to the account of such operation.

"Its progress in different subjects, and under different circumstances, is different; in some it is slow and long in passing from toe to toe, and from thence to the foot and ancle; in others its progress is rapid, and horridly painful: it generally begins on the inside of each small toe, before it is visible either on its under or upper part; and when it makes its attack on the foot, the upper part of it first shows its distempered state, by tumefaction, change of colour, and sometimes by vesication; but wherever it is, one of the first marks of it is a separation or detachment of the cuticle.

"Each sex is liable to it; but for one female in whom I have met with it, I think I may say, that I have seen it in at least twenty males. I think also that I have much more often found it in the rich and voluptuous, than in the labouring poor; more often in great eaters, than free drinkers. It frequently happens to persons advanced in life, but is by no means peculiar to old age. It is not, in general, preceded or accompanied by apparent distemperature either of the part, or of the habit. I do not know any particular kind of constitution which is more liable to it than another; but as far as my observation goes, I think that I have most frequently observed it to attack those who have been subject to flying uncertain pains in their feet, which they have called gouty, and but seldom in those who have been accustomed to have the gout regularly and fairly. It has, by some, been supposed to arise from an ossification of vessels; but for this opinion I never could find any foundation but mere conjecture.

"The common method of treating this disease is, by spirituous fomentations, cataplasms actually and potentially warm, by dressings of the digestive kind, as they are called, animated with warm pungent oils, and balsams, &c. and internally, by the Peruvian bark.

"I wish I could say that this, which, with little alteration, has been the general practice, had been most frequently, or even often successful; but I am, from long and repeated experience, obliged to say that it has not.

" I am ſenſible that many of my readers will be ſurpriſed at my affirming, that the Peruvian bark will not ſtop a mortification, a diſtemper in which, for ſome years, it has been regarded as ſpecific; but I muſt beg not to be miſunderſtood: I mean to confine my obſervation and my objection to this particular ſpecies of mortification, which I regard as being *ſui generis*; and under this reſtriction I muſt repeat, that I have ſeldom, if ever, ſeen the bark ſucceſsful: in all other caſes, wherein it is uſed or recommended, no man has a higher opinion of it; but in this I cannot give it a praiſe which it does not deſerve.

" I believe I may venture to ſay, that I have tried it as fairly, as fully, and as variouſly as any man has or can: I have given it in the largeſt quantity, at the ſhorteſt intervals, and for the longeſt poſſible ſpace; that is, as long as the patient's life would permit: I have given it by itſelf, in decoction, extract, and ſubſtance; I have combined all theſe together; I have joined it with nitre, ſal. abſynth. with ſnake-root, with confect. cardiac. with volatile ſalts, and with muſk, as different circumſtances ſeemed to require, or admit: I have uſed it as fomentation, as poultice, as dreſſing; I have aſſiſted it with every thing which has been uſually thought capable of procuring, or aſſiſting digeſtion; ſtill the diſtemper has continued its courſe, perhaps a little more ſlowly, but yet it has ended in death.

" I am ſorry to rob one of our great medicines of any part of its ſuppoſed merit; but as on the one hand its claim, in this inſtance, is unjuſt, and as on the other I hope to add as much to the character of another, the res medica will be no ſufferer.

" Some time ago, I had a patient labouring under this complaint, who, from antipathy, obſtinacy, or ſome other cauſe, could not be prevailed on to take bark in any form whatever. I made uſe of every argument, but to no purpoſe: fomentation, poultice, and the uſual dreſſings, were applied in the uſual manner; the diſeaſe advanced, ſome days more, ſome days leſs, and at the end of a fortnight the ſmall toes were all completely mortified, the great one became blackiſh, the foot much ſwollen, altered in colour, and the diſeaſe ſeeming to advance with ſuch haſty ſtrides, that I ſuppoſed a very few days would determine the event. The pain in the foot and ancle was ſo great, and ſo continual, as totally to deprive the patient of ſleep. On this account, and merely to procure ſome remiſſion, I gave two grains of opium at night, which not having the deſired effect, I repeated it in the morning. Finding, during the following day, ſome advantage, I repeated the ſame doſe night and morning, for three days; at the end of which time the patient became quite eaſy, and the appearances on the foot and ancle were viſibly more favourable. Encouraged by this, I increaſed the quantity of the medicine, giving one grain every three or four hours, taking care to watch its narcotic effect, and to keep

the belly empty by glyſters. In nine days from the firſt adminiſtration of the opium, all the tumefaction of the foot and ancle totally ſubſided, the ſkin recovered its natural colour, and all the mortified parts plainly began to ſeparate; in another week they were all looſe, and caſting off, the matter was good, and the incarnation florid. During the whole of this time, I continued the uſe of the opium, varying its quantity as circumſtances required, but never gave leſs than three or four grains in twenty-four hours.

"When the ſloughs were all caſt off, the bones ſeparated, and I had only a clean ſore to dreſs and heal, I gradually left off the medicine.

"I am very willing to acknowledge, that however well pleaſed I might be with the event of this caſe, yet I really regarded it as accidental; ſo much ſo, that having very ſoon after another opportunity, I did not care to truſt to opium alone, but joined the bark with it. The event was equally fortunate. But although I had joined the cortex with the extractum thebaicum, and did therefore attribute the ſucceſs to their united powers, yet the effect was ſo very unlike to what I had ever ſeen from the bark without opium, that I could not avoid ſeriouſly and often reflecting on it, and determining to uſe it by itſelf whenever another opportunity ſhould offer. I did ſo, and ſucceeded in the ſame happy manner, though under the very diſagreeable circumſtances of ſeventy years of age, a broken, diſtempered conſtitution, and the diſeaſe making a haſty progreſs.

"To relate caſes which are nearly, or at leaſt materially ſimilar, is of no uſe: I ſhall therefore only ſay, that every opportunity, which I have had ſince of making the experiment, has ſtill more and more convinced me of the great value and utility of this medicine, and of its power of reſcuing from deſtruction, perſons under this affliction.

"I cannot ſay that it has never failed me: it certainly has; but then it has been under ſuch circumſtances, as I think would fairly account for the failure.

"I ſhould be exceedingly ſorry to be miſunderſtood; I ſhould be ſtill more ſo to miſlead any body; and therefore I beg it may be noticed, that I do not propoſe opium in this caſe, as an univerſal, infallible ſpecific; I know, from experience, that it is not: but as I alſo know, from repeated experience, that it will, under proper management and direction, do more than any, or than all other medicines; and that I have, by means of it, ſaved ſome lives, which, I am very ſure, would, under the common and moſt approved method of treatment, without it, have been loſt; I could not anſwer to myſelf the not communicating what I had obſerved.

"If this was an experiment, in which the life or limb, or health of the patient was in any degree endangered, or by which the perſon

on whom it may be tried, could, in any degree, be injured, I ſhould have withheld what I now publiſh, until a greater length of time, and more experience, had rendered it ſtill more abſolutely certain; and I ſhould have thought myſelf ſtrictly vindicable in ſo doing: but as this is a medicine, whoſe general effects are well known, and which is, at the ſame time, ſo capable of direction and management, that it is almoſt impoſſible for any perſon who deſerves to be truſted with medicine at all, to do any material harm with it, I thought it would be wrong and unjuſt to conceal what had occurred to me, leſt I might thereby deprive the afflicted of an aſſiſtance which, I verily believe, is not to be obtained from any other quarter.

"In ſhort, from what I have ſeen and done, I am perfectly convinced that, by its means, and by its means ſolely, I have ſaved lives which, without it, muſt have been loſt.

"If I am right," continues the author, "in my conjecture concerning this hazardous and deſtructive malady; and if the method which I have propoſed and practiſed ſhould prove as ſucceſsful in the hands of others as it has in mine, I cannot help thinking, that the external or chirurgic treatment of the diſorder might be amended; that is, might be made to coincide more than it does at preſent with ſuch ſoothing kind of plan.

"Since I have had reaſon to embrace this opinion, and to act in conformity to it, I have found more advantage from frequently ſoaking the foot and ancle in warm milk, than from any ſpirituous or aromatic fomentations whatever; that is, I have found the one more capable of alleviating the pain, which ſuch patients almoſt always feel, than the other; which circumſtance I regard as a very material one. Pain is always an evil, but, in this particular caſe, I look upon it as being ſingularly ſo. Whatever heats, irritates, ſtimulates, or gives uneaſineſs, appears to me always to increaſe the diſorder, and to add to the rapidity of its progreſs; and, on the contrary, I have always found, that whatever tended merely to calm, to appeaſe, and to relax, at leaſt retarded the miſchief if it did no more.

"The whole plan of the chirurgical treatment of this diſeaſe is founded on a general idea of warming, invigorating, ſtimulating, and reſiſting putrefaction; and the means generally made uſe of are very proper for ſuch purpoſe: but I muſt own that I think the purpoſe, or intention, to be improper.

"Upon this principle, the old theriaca Londinenſis, and the preſent cataplaſma e Cymino, have been, and ſtill are, ſo freely uſed on this occaſion. A compoſition of this kind, if it does any thing, muſt heat and ſtimulate, and it is by heating and ſtimulating the ſkin, to which it is applied, that it ſo frequently does that miſchief which I am confident it often does, though ſuch miſchief is ſet to the account of the nature of the diſorder. Caſes exactly ſimilar, in

all circumſtances, are not to be met with every day; but I am from experience convinced, that of two, as nearly ſimilar as may be, in point of pain, if the one be treated in the uſual manner, with a warm, ſtimulating cataplaſm, and the other only with a poultice made of the fine farina ſeminis lini, in boiling milk or water, mixed with ung. ſambuc. or freſh butter, that the pain, and the progreſs of the diſtemper, will be much greater and quicker in the former than in the latter.

"When the black or mortified ſpot has fairly made its appearance on one or more of the toes, it is the general practice to ſcarify or cut into ſuch altered part with the point of a knife or lancet. If this inciſion be made merely to learn whether the part be mortified or not, it is altogether unneceſſary, the detachment of the cuticle, and the colour of the ſkin, render that a decided point: if it be not made quite through the eſchar, it can ſerve no purpoſe at all; if it be made quite through, as there is no confined fluid to give diſcharge to, it can only ſerve to convey ſuch medicines as may be applied for the purpoſe of procuring digeſtion to parts capable of feeling their influence, and on this account they are ſuppoſed to be beneficial, and therefore right.

"When the upper part of the foot begins to part with its cuticle and to change colour, it is a practice with many to ſcarify immediately; here, as in the preceding inſtance, if the ſcarifications be too ſuperficial, they muſt be uſeleſs, if they be ſo deep, as to cauſe a ſlight hæmorrhage, and to reach the parts which have not yet loſt their ſenſibility, they muſt do what indeed they are generally intended to do, that is, give the medicines, which ſhall be applied, an opportunity of acting on ſuch parts.

"The medicines moſt frequently made uſe of for this purpoſe are, like the theriaca, choſen for this ſuppoſed activity; and conſiſt of the warm, pungent oils and balſams, whoſe action muſt neceſſarily be to ſtimulate and irritate: from theſe qualities they moſt frequently excite pain, which, according to my idea of the diſeaſe, is diametrically oppoſite to the proper curative intention; and this I am convinced of from repeated experience.

"The dreſſings cannot conſiſt of materials which are too ſoft and lenient; nor are any ſcarifications neceſſary for their application. But I would go farther and ſay, that ſcarifications are not only uſeleſs, but in my opinion, prejudicial, by exciting pain, the great, and chiefly to be dreaded, evil in this complaint. The poultice ſhould be alſo ſoft, ſmooth, and unirritating; its intention ſhould be merely to ſoften and relax; it ſhould comprehend the whole foot, ancle, and part of the leg; and ſhould always be ſo moiſt or greaſy as not to be likely to become at all dry or hard, between one dreſſing and another.

To theſe injunctions, which equally apply to common mortification, Mr. Pott adds,

"When the toes are, to all appearance, perfectly mortified, and

seem so loose as to be capable of being easily taken away, it is, in general, thought right to remove them. However rotten and loose they may seem to be, or really are, yet while they hold on, they hold by something which is still endued with sensation, as may always be known, if they be bent back or twisted with any degree of violence.

"I will not enter into a dispute about the sensibility or insensibility of ligaments, nor undertake to determine whether they be ligaments or any other kind of parts which still maintain the connection of the toes with their own respective joints, or with the metatarsal bones; it is sufficient for me to know and to inform the young practitioner, that however loose they may seem, yet if they be violently twisted off, or the parts by which they hang be divided, a very considerable degree of pain will most commonly attend such operation, which therefore had much better be avoided; and that I have seen this very pain, thus produced, bring on fresh mischief, and that of the gangrenous kind.

"If the patient does well, these parts will certainly drop off: if he does not, no good can arise from removing them."

There are some instances of what is called *dry gangrene*, in which the parts continue totally mortified for a great length of time, without turning very flaccid, or running into dissolution. But such cases never occur from inflammation; they happen commonly from the flow of blood to such parts being put a stop to by compression of one kind or another, tumors, ligatures, or other similar causes, obstructing the principal arteries which used to supply them; which, when the stoppage of the circulation is complete, always occasions a very slow, tedious mortification; and as the parts in such instances are no longer supplied with fresh quantities of fluids, while a considerable evaporation must still be going on, such a degree of humidity cannot, therefore, possibly occur as does in other cases of gangrene. Hence that species of the disorder has, perhaps, with propriety enough, been termed the *dry gangrene*.

There is another variety of the disease termed *white gangrene*; in which the parts supposed to be mortified do not turn black, but retain nearly their former colour, &c. Whether such a complaint, however, can with propriety be denominated *gangrene* or not, may probably be doubted: but as it is chiefly that species of the disorder which succeeds inflammation that is here particularly treated of, and in which no such varieties are ever observed, it is not necessary to carry the enquiry farther.

The *prognosis* in every case of gangrene is doubtful at first, as even in the slightest cases the patient may suffer from the spreading of the disease; but slight cases, from external injuries, are more favourable than those which arise from internal causes, though no person can be considered safe till the diseased parts are separated, and even entirely cast off. When inflammation happens round a mor-

tified part, more especially if pus be formed, we may pretty certainly pronounce that the mortified part will be thrown off.

When there is reason to suspect, from the violence of the fever and great heat of the inflamed part, that it will terminate in gangrene, bloodletting, and whatever may have a tendency to moderate the inflammation, may check its progress. But as the patient in such cases is sometimes apt to sink afterwards, nothing more ought to be done than is merely necessary to moderate the present symptoms. If an inflamed surface put on a gangrenous appearance when the patient is weak, and the pulse low, we must have recourse to whatever may invigorate the system, viz. a nourishing diet, with the free use of wine. Peruvian bark likewise is to be given in as great quantities as the stomach of the patient will permit. When the stomach cannot bear enough in substance, which is the best form of exhibiting it, it may be given either in form of tincture or joined with aromatics. Nor must the internal use of *musk* and *volatile ammonia*, spoken of under the head of gun-shot wounds, be forgotten. External applications also, such as are of a stimulating nature, may likewise be useful.

In the case of gangrene *arising from cold*, the part must be immersed in very cold water, or rubbed with snow; for if any thing warm be applied, or the patient brought near a fire, it certainly mortifies. If the whole body has become torpid with cold, the same practice must be followed; the very cold water should be afterwards changed for some that is a little warmer, and the patient gradually brought to a proper degree of heat. Rubbing with salt is sometimes found useful. If the whole body be benumbed, cordials are not to be administered too suddenly. A glass of cold wine should first be given, afterwards warm wine by itself, or with spices. If stronger cordials be required, ardent spirits may be employed. Notwithstanding the greatest attention, however, a mortification sometimes takes place, and in some instances very suddenly: as in the case of carbuncle, where, after an inflammation has continued for scarcely 24 hours, the parts become black, and end in real mortification.

In the *treatment of mortified parts*, a variety of external applications have been pointed out, and particularly those of the antiseptic kind; such as bread poultices containing one fourth part of finely powdered charcoal, which corrects the fœtor very effectually. Some have improperly used the warm gums and balsams, ardent spirits, and even alcohol; and to admit of their nearer application to the sound parts, with a view to the preservation of these from putrefaction, deep scarifications through the diseased, and into the sound parts, have been formerly recommended. But although such methods may be of use in preserving dead animal substances from corruption; yet that they will always prove serviceable in the same manner in living bodies, is plainly very much to be doubted. Nay, it is even apprehended, by the strong irritation they always

occaſion when applied to a living fibre, that, in ſuch caſes as theſe, they may rather do miſchief; it being only a very ſlight degree of inflammation that is required to bring on a ſuppuration. The inciſions, when carried into the ſound parts, with a view to facilitate the operation of ſuch remedies, may likewiſe do harm; not only from the riſk of wounding the blood-veſſels, nerves, and tendons, that lie in the way, but alſo by allowing a free and farther entrance of the putreſcent fluids into the parts not yet affected: and unleſs they are carried ſo deep as freely to reach the ſound parts, applications of the antiſeptic kind can never have any effect in anſwering the purpoſe for which they were intended.

All the advantages commonly expected from the great variety of applications recommended for gangrene, are obtained with more eaſe, and generally with more certainty, from the uſe of ſome gentle ſtimulating embrocation, which, by exciting a ſlight irritation upon the ſurface, and eſpecially when aſſiſted by a free uſe of the bark, at laſt commonly produces ſuch a degree of inflammation as is wiſhed for. With this latter view, a weak ſolution of ſal ammoniac in vinegar and water has been known to anſwer exceedingly well.

(No. 27.) ℞ Ammoniæ muriatæ drach. ij.
Aceti unc. ij.
Aquæ diſtillatæ unc. vj.
Fiat ſolutio.

This forms a mixture of a very proper ſtrength for every purpoſe of this kind; but the degree of ſtimulus can be eaſily either increaſed or diminiſhed, according to circumſtances, by uſing a larger or ſmaller proportion of the ſalt.

Although, for the reaſons formerly advanced, inciſions may not in general be proper; yet in ſuch caſes where the mortification runs very deep, it is ſometimes of ſervice to make ſcarifications into the diſeaſed parts, ſo as to remove part of them; which, by taking off a conſiderable load perhaps of putrid fleſh, not only leſſens the fetor, which in ſuch caſes is always conſiderable, but often renders it more eaſy for the ſound parts to free themſelves from the remainder. When, with this view, however, inciſions are had recourſe to, care ſhould always be taken, that they be not carried the depth of the ſound parts.

When by the uſe of external or internal remedies, a ſeparation of the mortified part has been effected, and a diſcharge of pus produced, the remaining ſore is then to be conſidered merely as a ſimple purulent ulcer, and may be treated in the ſame manner.

We ſhall conclude this ſubject with ſome remarks on the effect of inflammation on bones.

A caries is an effect of inflammation on a bone, and conſtitutes a diſeaſe of the ſame nature with a gangrene or ſphacelus of the ſoft parts. Like the gangrene, it ariſes from a ſtoppage of the circulation through the bone; and, as the number of blood-veſſels anaſ-

tomoſing with one another is much ſmaller in the hard bones, than in the ſoft parts, a caries will very readily enſue from the ſtoppage of the large artery which enters any bone. For the ſame reaſon, a caries likewiſe very frequently enſues from an injury of the perioſteum, for all the blood-veſſels of the bone paſs through the perioſteum. This, however, will not happen unleſs ſome conſiderable artery which enters the ſubſtance of the bone be injured, or part of the ſubſtance of the bone itſelf be deſtroyed.

A bone which has been laid bare generally becomes carious about the fourth day, for, if the bone retains its natural colour beyond that time, it is moſt probable that no caries will take place. The ſigns of a caries beginning to take place, are the bone's loſing its natural healthy appearance, and aſſuming firſt a pale white, and then a yellowiſh colour. In this ſtate it will ſometimes remain for a conſiderable number of days, growing gradually deeper and deeper coloured, till at laſt it becomes brown, and then extremely black; when we may ſuppoſe that the mortification is complete in the bone, as we do in the ſoft parts when they aſſume this colour. Along with this change of colour, the bone becomes gradually full of ſmall holes, the number of which increaſes every day, until at laſt the hardeſt bones become quite ſpongy. Theſe changes are attended with the diſcharge of a very fetid ſanies from the ſurrounding ſoft parts, which becomes more and more acrid, as the blackneſs of the bone advances, and at laſt acquires a blackiſh colour as well as the bone itſelf. After the bone has become black and ſpongy, the mortified part looſens from the reſt, yielding, upon preſſure, an oily-like matter of an extreme diſagreeable ſmell, and which is of ſuch a particular kind, as to become a diagnoſtic of the diſeaſe. All the time that this diſeaſe of the bone continues, the ſoft parts continue of an unhealthy, pale, and flabby appearance; large granulations of fleſh ſhoot up, which contract the orifice of the ſore, though it will not heal up entirely until the carious part of the bone be caſt off, and fully ſeparated from the reſt. This is effected by means of fleſhy granulations ariſing between the ſound and mortified parts of the bone, which puſh off the latter, and at laſt conſolidate into a long lamina.

A caries may be produced in a bone by any external accident, as a wound, contuſion, &c.; or it may, like the gangrene of the ſoft parts, ariſe from a cacochymy of the blood and juices, in which caſe it frequently begins with an inflammation of the perioſteum. Mr. O'Halleran deſcribes it under the title of *gangrene* of the ſolids, and the cancerous gangrene. It very often attends the venereal ulcer, eſpecially where great quantities of mercury have been taken. In ſcrofula, likewiſe, the caries of bones very frequently occurs; in the ſcurvy, and all other diſeaſes where the juices become very acrimonious. A mere loſs of ſubſtance, however, will not occaſion a caries in the bones, any more than a loſs of ſubſtance in the fleſhy parts will always occaſion gangrene; for large portions

of the cranium are frequently removed in operations of the trepan, and in fractures, without any caries taking place. In general those bones which are the beſt ſupplied with blood-veſſels, are leaſt ſubject to caries; becauſe there are, in theſe, ſo many anaſtomoſing veſſels, that the deſtruction of one artery is not attended with any bad conſequence; and the cranium is better ſupplied in this reſpect than any other bone in the human body.

In attempting the cure of a caries, the removal of the diſeaſed parts of the bone, from ſuch as are in a ſound ſtate, is the chief object; for, when once a bone has a tendency to become carious, there is no hope of its being brought back to a ſound ſtate, as may ſometimes be done with the ſoft parts when they have a tendency to gangrene. The ſeparation, or exfoliation as it is called, of the bone takes place more readily in ſuch as are hard and ſolid, as in the middle of the long bones, than in their ſpongy extremities, or bones of a ſofter texture. It takes place alſo more readily, as may naturally be ſuppoſed, in young perſons where the vital powers are ſtrong, than in the old and infirm; alſo in bones which are well ſupplied with blood veſſels, better than in thoſe which are not. In vigorous conſtitutions the exfoliation takes place by means of the natural force of the ſyſtem; and proceeds in the manner already deſcribed, which is a proceſs exactly ſimilar to that by which the gangrenous or ſphacelated ſoft parts are ſeparated from thoſe which are ſound. In the caſe of caries, however, the ſeparation goes on much more ſlowly than in the gangrene, becauſe the veſſels of the bones are both fewer in number and act leſs vigorouſly than thoſe of the ſoft parts. The exfoliation may be promoted by thoſe medicines which promote the ſeparation of the gangrenous ſoft parts from thoſe which are ſound. The diſeaſed part of the bone ought to be fully laid bare, either by a longitudinal, or initial inciſion, if the diſeaſed part is of any conſiderable extent; or ſometimes it may be neceſſary totally to remove ſome of the ſoft parts.

It has been the practice in caſes of caries, to apply acrid powders, hot and ſpirituous tinctures, &c. to every bone which was in the leaſt tainted with the diſeaſe, or even to every bone that was only laid bare. But this is certainly a very injudicious mode of proceeding, as it is impoſſible that ſuch powders can penetrate through the ſubſtance of the diſeaſed bone, though they may induce a caries in ſuch as are ſound, by injuring and inflaming the perioſteum. The application of the actual cautery muſt be looked upon as equally inefficacious and injurious; for, if this be applied in ſuch a manner as to deſtroy entirely the diſeaſed part of the bone, the heat muſt neceſſarily deſtroy alſo ſome part of that which was ſound, and thus bring on a new caries. If applied in ſuch a manner as not to do this, it cannot be ſuppoſed to be of any avail. Inſtead of theſe tedious and uncertain methods of removing the bone, ſome have boldly recommended to ſtrike off at once the diſeaſed part with a

chiſel and mallet; but this muſt be liable to the ſame objections with the former, viz. deſtroying part of the ſound bone, and thus encreaſing the caries.

Nevertheleſs, in all caſes of this diſeaſe, it certainly is of the utmoſt importance to diminiſh the diſeaſed and corrupted part of the bone as much as poſſible; not only becauſe a thin ſcale of carious bone muſt be more eaſily thrown off than a thick and large one, but becauſe the fœtid matter produced by the corrupted bone muſt undoubtedly be augmented in quantity much more, by allowing a large piece of corrupted bone to remain, than by taking it away. The moſt approved method of doing this, is by perforating the diſeaſed bone in a number of places very near one another, with a trephine, or other ſharp inſtrument. It will be known when the carious part is perforated, by the patient's beginning to feel the operation painful; and, whenever this is the caſe, the ſurgeon ought to ſtop. The perforation ought to be renewed every third or fourth day; by which means the extent of carious parts will very ſoon be greatly diminiſhed, and the ſmall corrupted bits which remain between the holes will inſenſibly moulder away. There are indeed ſome bones which do not exfoliate or throw off a ſolid bony ſcale, though ever ſo carious, ſuch as thoſe of the carpus and tarſus, the ſpongy extremities of the cylindrical bones, &c. In theſe, the carious part inſenſibly decays, and is diſcharged along with the dreſſings. In theſe caſes, ſetons, which can act on the ſpongy and rotten part of the bone, when the cord is drawn, are likewiſe of uſe. Where the caries is of great extent, it will be proper to uſe ſuch an inſtrument as is made uſe of by the coopers for boring the heads of their caſks. By this a conſiderable extent of ſurface is taken away, and the holes will be ſeparated from one another only by narrow partitions, which being cut through the extent of the carious part, will be very inconſiderable, and will come away inſenſibly, as already mentioned. When a caries goes through the whole extent, it is common to make uſe of a common trepan for taking out a piece throughout the whole ſubſtance of the bone.

In caries, as in gangrene, it is the power of the living parts which ſeparates the dead ones; and, unleſs this cure be effected by means of this power, it cannot be effected at all. Beſides thoſe remedies which invigorate the ſyſtem in general, therefore, there can little be done farther than removing as much of the diſeaſed part of the bone, with as little injury to the ſound parts which lie below, as poſſible, and which can beſt be done in the method already mentioned. It is, however, of conſiderable conſequence to deſtroy as much as poſſible the putreſcency and fœtor of the matter which iſſues from it. It is doubtful whether this can be effectually done by any other means than that of invigorating the ſyſtem by proper medicines. Some topical antiſeptics, however, are recommended, and probably may be of ſervice, as decoctions of Peruvian bark,

camomile, and other vegetables which correct putrefcency, ſolution of camphor in weak ſpirits, &c. It is alſo proper to apply a good quantity of dry charpie, that the matter may be abſorbed as ſoon as it is formed. Vinegar is likewiſe of conſiderable ſervice in correcting this fœtor; and, from the diſſolving power of this liquid, it is likewiſe of ſervice in looſening the adheſion of the mortified part of the bone. After the carious part of the bone is removed, emollient ointments, ſpread over that which is ſound, aſſiſt in producing the fleſhy granulations, which are afterwards converted into bone, better than any other kind of medicines which have yet been deſcribed by writers on this ſubject.

Sect. III. *Of* Erysipelas.

We have already given Mr. Hunter's ideas of this particular affection in the general account of inflammation. The Erysipelas is alſo fully deſcribed by Dr. Cullen under *medicine* in our firſt volume. We ſhall in this place therefore confine ourſelves principally to the treatment of it *topically*, if ſuch a thing be admiſſible.

Moſt writers have contended that the caſes occur very ſeldom in which we ſhould be juſtified in uſing any topical remedies whatever. Where the diſeaſe is ſituated on the head or face, cold or aſtringent applications are extremely dangerous, and liable to occaſion phrenitis. If any thing is to be attempted, it is to aſſuage the burning heat of the ſkin, by letting the patient hold his face over a veſſel of hot water into which ſome camphor is thrown, ſo that the ſteam may be felt; or in caſe of a troubleſome effuſion of lymph from the ſkin, we may abſorb it by applying occaſionally a little ſtarch powder.

Where the diſeaſe is ſituated on the extremities, camphorated ſpirits have been employed, or, by ſome practitioners, the following lotions from the Pharmacopœia Chirurgica:

(No. 28.) ℞ Spiritus camphorati drach. ij.
Aquæ lithargyri acetati drach. j.
Aquæ diſtillatæ lib. j.

The mixture of theſe is to take place in the order they are ſet down, otherwiſe the camphor will be ſeparated.

(No. 29.) ℞ Aquæ ammoniæ acetatæ
Spiritus vinoſi rectificati
Aquæ diſtillatæ ſing. unc. iv. miſce.

Or ſome have preferred bathing the part with aqua ammoniæ acetatæ alone. But in any caſe, theſe applications are previouſly warmed, in a tea-cup placed in hot water; and the part covered immediately after their uſe. Greaſy and aſtringent applications have alſo been wholly interdicted in all caſes of erylipelas; but a much bolder practice has prevailed amongſt thoſe who conſider

themſelves more enlightened on this ſubject. Among theſe is Mr. Latta, who expreſſes himſelf in the following terms.

"As (ſays he) the fever attending an eryſipelas is ſometimes very high, bleeding is frequently indicated; but it has generally been imagined that this was *univerſally* prejudicial in the diſorder we ſpeak of. This, however, ſeems not to be well founded; for it is certain that bleeding has often been practiſed with ſucceſs in the eryſipelas, and now forms one of the principal remedies for the diſeaſe. A like prejudice, and equally unjuſt, has taken place againſt all kinds of humid applications in the eryſipelas; in conſequence of which, it has been ſuppoſed that nothing can be ſafely applied in eryſipelatous caſes but flour, ſtarch, and other dry and inſignificant powders. Unctuous applications are likewiſe rejected, though for no good reaſon. It is certain that theſe remedies are not productive of the effects aſcribed to them, viz. the promoting the effuſion of ſerum into the veſicles above mentioned. Both the unctuous applications, and weak ſolutions of ſaccharum ſaturni, have often given inſtant eaſe from the pain, without being attended with any diſadvantage afterwards; but, in general, the ointments are preferable to moiſt applications. When unctuous applications, however, are not attended with any good effect, it has been found of the utmoſt benefit to expoſe the affected part to the air, and wet it ſlightly with the ſaturnine ſolution. Warm and moiſt applications are always pernicious."

As this deviation from the uſual practice ſtands in need of facts to juſtify it, we ſhall add ſome caſes (of a *mixed* kind, as we think) treated by this gentleman in the new manner. He ſays,

"Miſs M——, aged 40, of a rather groſs habit of body, happened, by ſlipping her foot when ſtepping into a coach, to bruiſe the ſkin of the fore-part of her leg, from the ancle to near the knee; but, as the pain was ſlight, little notice was taken of it. Towards the evening of the ſecond day, however, it began to grow painful and hot, with chillneſs all over her body. The leg was alſo ſomewhat ſwelled, and very red. At night ſhe wrapped it up in flannel, and drank ſome warm negus, with a view to promote perſpiration, by which means ſhe hoped to get rid of her complaints; but, during the night-time, her pain, as well as the burning heat of the parts, were greatly increaſed, and ſhe became exceeding reſtleſs and thirſty, with great heat over her whole body.

"As the diſeaſe now wore an alarming appearance, ſhe thought proper to ſend for her ſurgeon. He found the whole leg greatly ſwelled from the ancle to the knee, and every-where red, but remarkably ſo along the whole courſe of the tibia. Two table-ſpoonfuls of ſaline mixture were ordered every third hour, and a large cataplaſm of bread and milk applied to the leg. A cooling injection was given at night, and the cataplaſm continued. I viſited the patient next morning, along with the ſurgeon. Her pulſe was

upwards of 120, and feeble, her ſkin hot, with great thirſt and parched tongue; many parts of the leg appeared gangrenous, and the ſwelling extended all along the thigh of the ſame ſide to the groin. with a conſiderable degree of yellowneſs, but no pain. The poultice was removed, the gangrenous parts waſhed well with brandy, and cloths dipped in that ſpirit applied to the parts affected; the reſt of the limb wrapped up in flannel filled with flour Half a dram of the bark, with a glaſs of port, was ordered every two hours. At night her pulſe was quick and ſmall. the medicines had remained on her ſtomach, but the gangrene made a rapid progreſs, and next morning ſhe died.

" Mr. J. S. aged between 30 and 40, happened to ſprain his ancle in going home, but ſo ſlightly. that he did not think of calling any medical aſſiſtance that night. Next morning, on getting out of bed, finding the pain ſomewnat increaſed, I was ſent for; but ſtill, as there ſeemed to be but little the matter with it, I contented myſelf with ordering him to bathe it frequently with the ſaturnine ſolution formerly mentioned, and directing him to ſit quiet for a day, laying the limb upon a footſtool, with a pillow under it. At this time he had little pain; but in the afternoon, having drank rather freely of warm rum and water, with ſome of his acquaintance who came to viſit him, the ſymptoms ſeemed to be thereby greatly exaſperated; for, next day, about one o'clock, I found him in bed, complaining greatly of pain and heat in the ancle and upper part of his foot. The parts were conſiderably ſwelled; and he informed me that this augmentation of ſymptoms had taken place during the night, and that he had a rigor on going to bed. On taking away the flannel I obſerved the ſwelling to be extremely great, and to ſurround the whole foot and ancle with great redneſs. Sixteen leeches were inſtantly ordered to be put upon different parts of it, and the diſcharge of blood to be promoted by warm dry linen rags; and, as ſoon as this was ſtopped, four folds of linen, dipped in the ſaturnine ſolution, were ordered to be applied to the parts affected, and to be kept on conſtantly till I ſhould return; and, in the mean time, a briſk purge of Rochel ſalt was ordered.

" At night, I found that the leeches had bled plentifully; he had kept the moiſt cloths conſtantly applied; and the pain, heat, and redneſs, greatly abated. The topical applications were continued, and he had two tableſpoonfuls of the common nitrous julap every three hours. His pulſe was about 100 in the morning, and had not increaſed in frequency. By next morning, the pain and redneſs were almoſt gone, excepting juſt at the place where he firſt complained after the accident. Six leeches were ordered immediately, and the bleeding to be promoted as before. At night the ſwelling was greatly abated, and the pain entirely gone, except on moving the joint. His ſolution was continued, and the ſalts repeated next

morning. Next day, I found that his falts had operated well; the fever entirely gone; little or no pain; but he continued the faturnine application for eight days longer, though no more fmyptoms of the difeafe remained.

"M. R. a ftrong healthy woman of 24 years of age, got a bruife on the upper part of her left foot, by which about the breadth of a fhilling of her fkin was ruffled. The hurt was fo flight, that, after applying a little Turner's cerate, no more was thought about the matter; but, on the 16th of June, eight days after the accident, fhe was fuddenly feized with an uncommon chillnefs all over her body, but particularly along the fpine. On going to bed, fhe foon became warm, was immediately feized with a head-ach, and pains in different parts of her extremities, but particularly in that part of her foot which had received the bruife, attended with a fenfation of burning heat. Next day, the whole foot and under part of her leg fwelled very much, with great pain and heat, which ftill continued to increafe. I faw her this day for the firft time, and found her labouring under fymptoms of a fever; her pulfe being 112, and ftrong; thirft great, and the belly coftive; the leg and foot were quite eryfipelatous, particularly the latter, to which, and to the ancle joint, the fwelling and deep red colour feemed to be moftly confined. Her menfes had been of a due quantity at laft period. I inftantly took away ten ounces of blood, and ordered eight ounces of the infufion of tamarinds, with two drachms of fenna; directing at the fame time her leg and ancle to be well wrapped up in flannel previoufly dufted with flour. Twelve leeches were applied to the upper part of the foot, and the flow of blood encouraged with dry cloths, and, after the blooding was ftopped, the foot and ancle were directed to be kept moift with a faturnine folution.

"June 19th, phyfic had operated well, the leeches bled freely, and the foot had been kept conftantly moift; her pulfe was no more than 96, and the pain of the foot and ancle much diminifhed; the fwelling and rednefs there were alfo abated, but the leg ftill continued very painful, fwelled, and red. The application of the faturnine folution was continued, and two tablefpoonfuls of a mixture of eight ounces of faline julap, made with two ounces of fpiritus mindereri, directed to be taken every three hours.

"21ft, Swelling and rednefs of the foot almoft gone, the leg much as before the laxative was repeated, the mixture ordered only now four times a-day, as fhe had fweated conficerably for near twenty four hours, and her tongue was moift.

"In five days after, the fymptoms had entirely difappeared, and fhe continued free from all complaints until within thefe two months paft; when, without any evident caufe, unlefs from the preffure of her buckle, an eryfipelatous tumor invaded the fame foot and ancle; but was completely removed in five or fix days, by the

application of leeches, the ſaturnine ſolution, and the exhibition of two gentle laxatives."

It appears, however, that extreme caution is neceſſary in thoſe caſes where the eryſipelas is attended with any degree of putreſcency. In theſe at leaſt bleeding and other evacuations would be highly improper. The bark, wine, with cordial and antiſeptic medicines, are then only to be made uſe of. The diſeaſe has been known to be *epidemic*, and attended with the following ſymptoms. The ſpace between the eyes and upper part of the noſe were firſt affected with ſwelling and inflammation. Next came on itching, redneſs, pain, low pulſe, vomitings, violent head-ach, &c. If this diſtemper was treated with bleeding, and other evacuations, the pulſe ſunk, and the patient died, while, on the other hand, the bark, cordials, and bliſters, were found of the greateſt importance.

It muſt farther be obſerved, that eryſipelas is ſometimes the conſequence of contuſions, particularly when the membranes of the cranium are injured; ſometimes it attacks the internal membranes of the ſtomach and inteſtines, occaſioning vomiting, hiccup, or purging, according to circumſtances.

Even new-born infants are ſubject to it. Of this we have ſeveral inſtances mentioned in the Medical Communications, as having occurred in the Britiſh Lying-in-hoſpital. In one of theſe the child was born with its whole face ſwelled and inflamed, the left ſide having a true eryſipelas upon it. There was likewiſe an inflammation on the legs, feet, and left hand: on each tibia there appeared an oblong ſlough, of a dark brown colour, almoſt livid; that on the left being very large. The cure was attempted by employing embrocations and emollient cataplaſms, fomentations, and the application of camphorated ſpirit of wine. This child appears to have ſwallowed the decoction of bark with great eaſe, as it ſwallowed *four ounces* of it daily from the very time of its birth. In three days, the ſwelling of the face, and other parts, was conſiderably ſubſided; but, on the third day, a veſication began to form on the left cheek, and another juſt above the eye-brow, on the ſame ſide. Theſe veſications increaſed in number and ſize, eſpecially on the legs, where they extended over the whole limb. Some confectio cardiaca was added to the decoction of bark, and pledgets dipped in oil of turpentine were applied to all the parts affected, previous to the application of the poultice. The veſications began to break on the ſixth day, and a ſanies began to flow from them. Yellow ſloughs alſo began to appear in different parts, and the child ſeemed much debilitated; and, for the laſt three or four days, had taken *eight* ounces of the decoction of the bark, with one drachm of the confectio cardiaca every twenty-four hours. The pledgets applied to the ſores were dipped in a digeſtive ointment, with oil of turpentine, and the following cataplaſm was ordered:

(No. 30.) ℞ Radicis lillii albi unc. iv.
Caricarum unc. j.
Rad. cepæ vulg. contus. unc. iſs.
Galbani colati unc. ſs.
Pulv. ſeminis lini g. s.

The lily roots and figs being boiled ſoft and bruiſed, the onions were afterwards added, and likewiſe the galbanum, previouſly incorporated with the yolk of an egg.

By theſe medicines the ſloughs ſoon began to ſeparate, and the child recovered, though not without the loſs of the little finger, the two joints of the finger next to it, and one joint of the middle finger. This diſtemper was for ſome time extremely fatal, not one of the children recovering who had been ſeized with it; though the bark operated as a ſpecific, and almoſt all of them recovered upon whom that medicine was tried. In thoſe in whom the diſeaſe terminated fatally, a mortification always enſued; and it was obſerved, that, in thoſe caſes where the diſeaſe ſeized the genitals at firſt, the danger was always the greateſt. The diſeaſe was obſerved to attack the children of weakly women, and of ſuch as were addicted to the habit of drinking ardent ſpirits.

In the tranſactions of a ſociety for the improvement of medical and chirurgical knowledge in London, we find the following curious obſervations, by Dr. Charles Wells, on the contagious nature of eryſipelas:

"It is not, I believe," ſays the doctor, "a common opinion among practitioners of medicine, that eryſipelas is a contagious diſeaſe. I ſhall therefore mention ſeveral facts, which ſeem to me to prove, that it may, ſometimes at leaſt, be communicated from one perſon to another.

"On the 30th of May, 1796, I viſited William Emerton, of about 60 years of age, who had been afflicted for ſeveral days with eryſipelas upon one of his legs. Veſicles were formed upon the inflamed part, and the ſurface of the ſkin beneath them was black. His pulſe was frequent and feeble, and he was ſomewhat delirious. A few days afterwards, he was ſent to St. Bartholomew's hoſpital, where I am informed he died.

"On the 10th of the next month I was deſired to ſee his widow. I found her labouring under the ordinary ſymptoms of what is commonly termed a low fever, when it is likely ſoon to prove fatal. There were, beſides, upon ſeveral parts of her ſkin, irregularly ſhaped patches, of a bright red colour, and of the ſize nearly of a halfcrown piece; but the parts ſo affected were not elevated, and gave no pain upon being touched. One of her arms, however, was conſiderably ſwelled, and appeared livid; but there was no viſible diſeaſe of the outer ſurface of the true ſkin of the arm, nor was the ſcarf-ſkin ſeparated from it. She died in the courſe of the ſame day. Now as this woman had been conſtantly in the ſame

room with her husband, during the time he had been ill at home, and fell sick a few days after his removal, and as her disorder bore some resemblance to erysipelas, I was induced to think it probable, that erysipelas might be communicated from one person to another; not recollecting at that time that a similar opinion had been advanced by the late Dr. Cullen of Edinburgh. My conjecture was soon after confirmed.

"On the 8th of August, 1796, I visited in Vine-street, Clerkenwell, an elderly man named Skelton, who had been attacked several days before with erysipelas of the face. In about a week afterwards he died.

"On the 19th of the following month, I saw a Mrs. Dyke, of about 70 years of age, the landlady of the house in which Skelton had been a lodger, and found her labouring under an erysipelas of her face. I enquired whether any other person had been ill in her house of the same disease, since the death of Skelton, and was told, that his wife had been seized with it a few days after his decease, and had died in about a week. During my attendance upon Mrs. Dyke, an old woman, her nurse, was attacked with the same disorder, and was sent to her parish work-house, where she died. Mrs. Dyke has since informed me, that a young man, the nephew of Skelton, was taken with the disease of which his uncle had died, shortly after visiting him, and survived the attack only a few days; that she herself had been several times with Skelton and his wife during their sickness, and, after their death, had removed some furniture from the room they had occupied to her own apartment; that during the time I attended her, it had been reported among her neighbours, that the plague was in her house, and that, in consequence, scarcely any person would come near her.

"I was now so strongly impressed with the belief, that erysipelas may be contracted by contagion, that being desired in the following December to visit a Mrs. Hunter, of Eyre-street-hill, and finding her face affected with that disease, one of my first questions to her was, whether she had been lately near any sick person. She answered, that about ten days before she had been for some time at the bed-side of a female friend, who had the St. Anthony's fire in her face, and that her friend having died a few hours after, she had on the following day assisted in placing her in a coffin. She added, that two sisters of her friend, and two servants of the family, one of them an old woman, her friend's nurse, the other a young girl, had all been ill of the same disorder. As she mentioned that Dr. Pitcairn had attended one of the sisters during her illness, I shortly after requested him to inform me, if what I had heard from Mrs. Hunter was correct. His answer was, that he had attended one of the ladies mentioned by Mrs. Hunter, while labouring under erysipelas of the face; that he had afterwards seen once a sister of hers, who was affected with the same disease; and had learned from the

family that another ſiſter, and two female ſervants, had alſo been attacked with it. Thus far Dr. Pitcairn's information reaches. From Mrs. Hunter I have further learned, that three of theſe perſons lived in one houſe, and two in another, but there was between the two houſes very frequent communication; that the old nurſe died ſhortly after her miſtreſs, and that the reſt recovered. Mrs. Hunter herſelf got well in a very few days, and no other perſon in her family was ſeized with the diſeaſe.

"It may be proper to mention here, leſt it ſhould be thought by ſome that the facts which I have related only indicate the great prevalence of eryſipelas from ſome general cauſe, that I ſaw no more than two other inſtances of the diſeaſe during the time in which they happened. Both occurred in one houſe; and one of the patients was ſeized with the diſeaſe a few days after meeting the other, while in a convaleſcent ſtate, upon a narrow ſtair-caſe.

"What I have here ſtated having, in my mind, put it beyond doubt, that eryſipelas is, ſometimes at leaſt, a contagious diſeaſe, I afterwards enquired of ſeveral practitioners of medicine in this place, whether any circumſtances had ever occurred to them which countenance this opinion. Mr. Whitfield, the apothecary of St. Thomas's hoſpital, Dr. Pitcairn, and Dr. Baillie, are thoſe who have furniſhed me with the moſt material information upon this ſubject.

"Mr. Whitfield, who has filled his preſent office for forty-four years, ſays, that in the ſummer of 1760, a perſon labouring under eryſipelas of the face was brought into St. Thomas's hoſpital, where he died; that, from ſome accident, another patient, having a different diſeaſe, was put into the ſame bed before it was properly aired; that this patient was ſhortly after ſeized with eryſipelas of the face; that ſeveral other perſons in the hoſpital were about the ſame time attacked with this diſeaſe, among whom was an upper nurſe, or ſiſter as ſhe is called, who died; that a rumour hence aroſe of the plague being in the hoſpital, which was thought of ſufficient importance by the treaſurer, to be mentioned by him to the grand committee of the hoſpital; and that they, in conſequence, deſired the phyſicians, ſurgeons, and apothecary, to draw up an advertiſement, in contradiction of the rumour, and to publiſh it in all the daily newſpapers. By conſulting the newſpapers of that time, I have found this advertiſement, but no mention is made in it of what gave riſe to the rumour; nor do any books now at the hoſpital throw light on the ſubject. From the well-known accuracy, however, of Mr. Whitfield, no doubt can be entertained of the juſtneſs of his ſtatement.

"Dr. Pitcairn, in addition to what I have already mentioned upon his authority, has informed me, that in February laſt he attended a lady, who had been attacked with a fever, immediately after being delivered of a child, which was accompanied with an

affection of her skin, somewhat like erysipelas; that her child, about three days after its birth, was seized with that species of erysipelas the French call *la gelure*, which first appeared about the pudenda, and afterwards extended itself to other parts of the body, among the rest to the face; that both the lady and her child died after a few days' illness; and that about eight days after the death of the child, the lady's mother and the servant maid, both of whom had attended it during its illness, were attacked with erysipelas of the face, from which both of them recovered."

Dr. Wells obtained the following intelligence on the subject from Dr. Baillie.

"During a part of the years 1795 and 1796, erysipelas of the face was much more frequent in St. George's hospital, than he had ever before known it to be. Many persons were attacked by this disease *after* they came into the hospital; and as the number of it in a particular ward was much greater than that in any other, he was hence led to suspect it was contagious. He has also furnished me with the following facts, not indeed upon his own authority, but upon that of a respectable practitioner of medicine, which he thinks unquestionable. A lady came to London, about the beginning of the present year, to attend a female relation, who was labouring under erysipelas of her face. But before she would enter upon this office, she enquired of the medical person who had the care of her friend, whether she might do it with safety. His answer was, that she might, as the disease was not contagious. She accordingly began to attend upon her friend, but in the space of a few days was herself seized with erysipelas of the face. A hired nurse of the same ladies was also attacked with that disease during her stay with them; but the sick person, by whom she was employed immediately before, had also been affected with it.

"Having thus," continues Dr. Wells, "related what I know of the infectious nature of erysipelas, from my own experience, and the information of my friends, I shall now mention, in a few words, what I have met with in books in relation to the same subject.

"Hoffman says, that there is considerable affinity between the plague and erysipelas, but that they differ in these two circumstances, that the latter disease is the less dangerous, and is not contagious.—Tom. ii. p. 99, folio.

"Sauvages informs us, in his Nosology, tom. i. p. 452, upon the authority of the history of the Academy of Sciences for 1716, that a contagious erysipelas prevailed that year at Thoulouse, in the convalescents from which the epidermis of the face fell off. But there are several errors in this account. No mention is made, in the History of the Academy for 1716, of any disease at Thoulouse. In that for 1715, p. 14, it is said, that there had been a contagious malady, *un pourpre*, as it is called by the historian, in the

towns and villages near to Thoulouſe, which carried off perſons attacked by it, in two or three days at fartheſt, and in which the ſkin (I ſuppoſe the ſcarf-ſkin, though the French term is *la peau*) fell off *entirely* from almoſt all thoſe who recovered. From this deſcription of the diſeaſe it evidently appears to have been the ſcarlet-fever, and not eryſipelas.

"Dr. Cullen, in his Firſt Lines, vol. ii. p. 228, ſays, that, as eryſipelas "may ariſe from an acrid matter externally applied, ſo it is *poſſible* that the diſeaſe may ſometimes be communicated from one perſon to another." I find from a note taken by me in 1780, while attending the lectures of that author, that in commenting verbally upon this paſſage, he mentioned, that eryſipelas had once been obſerved to be contagious in the Edinburgh infirmary. From the very cautious manner in which he expreſſes himſelf in his book, and from his not admitting into it the circumſtance of which I have juſt ſpoken, it is clear he was either unconvinced of its truth, or was unwilling to acknowledge it. Indeed, agreeably to his reaſoning upon this ſubject, the diſeaſe can never be communicated except by abſolute contact, and, when contracted in this way, muſt occupy, primarily at leaſt, the part only which has been touched. This is the whole of what I have collected reſpecting the contagious nature of eryſipelas, from the authors upon this diſeaſe whom I have conſulted.

"Should it now be admitted that eryſipelas is ſometimes contagious, it neceſſarily follows, that we ought, in all inſtances of it, to guard againſt its ſpreading. The caſe of the lady from the country, given by Dr. Baillie, on the one hand, ſhews the hurtful conſequence of inattention in this reſpect; and, on the other, the prevention of the ſpread of the diſeaſe in Mrs. Hunter's family is probably to be attributed to the precautions which I directed to be uſed for this purpoſe. Theſe conſiſted chiefly in keeping the room of the ſick perſon well aired, and in preventing all unneceſſary communication between her and every other perſon.

"Moſt writers upon eryſipelas have been ſo ſtrongly impreſſed with the opinion, that this diſeaſe, particularly when it attacks the face, depends upon, or is connected with, an inflammatory condition of the whole ſyſtem, that they have, without heſitation, attributed the delirium and coma, which occur in dangerous ſtates of it, to inflammation of the brain, or its membranes. But there are, I believe, no diſſections upon record, which ſupport this aſſertion; none ſuch at leaſt are to be found in the works of Bonetus, Morgagni, or Lieutaud. It ſeems, on the contrary, more probable, that the delirium and coma in this diſeaſe do, in no caſe, depend upon inflammation of the brain, or its membranes; for it is certain that they may exiſt in eryſipelas of the face without any ſuch cauſe, ſince Dr. Baillie found, upon opening the body of a perſon who died of that diſeaſe in January, 1796, and who had been affected

with delirium and coma, that the contents of the head were altogether free from any morbid appearance. From this fact a reaſon may, I think, be juſtly derived for ſuſpecting the propriety of the practice of attempting to cure eryſipelas by large evacuations, particularly of blood, which has been recommended in conformity to the opinion, that it depends upon an inflammatory ſtate of the ſyſtem."

In a note, the author mentions, as having ſome connection with the ſubject, that he once aſſiſted at the examination of the body of a ſtout young ſoldier, who had died comatoſe, while labouring under a ſcarlet fever, unattended with any conſiderable affection of the throat, in whoſe brain no mark of inflammation or extraordinary fulneſs of the blood-veſſels was diſcovered.

" But no indirect arguments," continues he, " have been found neceſſary to perſuade thoſe to relinquiſh that practice, in London at leaſt, who have witneſſed the effects of the Peruvian bark, when given early in this diſeaſe, in large and frequent doſes. The Peruvian bark is given in acute diſeaſes with two very different intentions. One is, either to enable the patient to ſurvive the diſeaſe, or to occaſion his being left by it in a leſs debilitated ſtate than he might otherwiſe be; without any expectation, that the duration of the diſeaſe will be ſhortened. Such, I believe, is the view of almoſt every practitioner, when he preſcribes the Peruvian bark in the continued fevers of this country. The other intention is, to put an end to the diſeaſe in which it is exhibited. It is in this latter way that the Peruvian bark ſeems to act, when given early in eryſipelas. Mrs. Hunter was the only patient of thoſe mentioned in this paper to have been ſeen by me, whom I viſited early in the diſeaſe; and ſhe was alſo the only one of them, upon whom I could prevail to take any conſiderable quantity of that medicine. She was a large woman, of a florid complexion, and a conſtitution vigorous from nature, and unbroken by intemperance or diſeaſe. Though fifty-one years of age, ſhe menſtruated as regularly, with reſpect both to periods and quantity, as at any former time of her life. In ſhort, ſhe was altogether ſuch a perſon as would have been deemed fit to bear large evacuations, by thoſe who attempt to cure eryſipelas through means of them. I ſaw her a few hours after her face began to ſwell, and immediately preſcribed for her the Peruvian bark. No other means of relief in the way of medicine were employed throughout the diſeaſe, except that, from the ſecond day, linen rags moiſtened with brandy were kept conſtantly applied to the parts affected. Under this treatment the diſeaſe gradually ſubſided, and on the fourth day it entirely diſappeared. On the fifth, her huſband having fallen ill of the gout, ſhe left her chamber, though in the middle of winter, to aſſiſt in the buſineſs of the bar-room of a public-houſe. None of the mildeſt caſes I have hitherto ſeen of regularly formed eryſipelas of the face, in which the Peru-

vian bark was not exhibited, have ever been cured in ſo ſhort a time as four days. But Mrs. Hunter's caſe was certainly not one of the mildeſt. For not to mention that two perſons had died of the diſeaſe in the houſe where ſhe moſt probably caught it, her face became, in the courſe of twenty-four hours after the attack of the diſeaſe, ſo much ſwelled, as to prevent the ſeparation of her eye-lids of one ſide from each other. Veſications had, during the ſame time, formed upon the ſwollen parts; her pulſe was frequent, her ſkin hot, and a dry brown ſtreak divided longitudinally the upper ſurface of her tongue. I therefore conclude, that the Peruvian bark, if it did not prevent death, ſhortened at leaſt conſiderably the duration of her ailment. She took four ounces of that medicine in ſubſtance, during the firſt three days of her illneſs; afterwards its doſe was leſſened. This quantity is indeed not nearly ſo great as what is ſometimes exhibited in eryſipelas by Dr. George Fordyce, who for upwards of twenty years has been accuſtomed to give, at St. Thomas's hoſpital, a drachm of the Peruvian bark, in powder, every hour, in dangerous ſtates of that diſeaſe. But four ounces of it in three days are certainly ſufficient to produce conſiderable effects upon the ſyſtem when diſordered; and as this medicine was given to Mrs. Hunter almoſt from the commencement of her illneſs, leſs was probably required for her cure, than would have been, if her diſeaſe had made greater progreſs before it was exhibited."

The reader cannot but have obſerved in theſe remarks a concurrence of opinion with what we have already ſaid on the treatment of eryſipelas. We conſider the facts communicated by Dr. Wells additionally valuable on that account.

CHAP. III. Of ULCERS.

Sect. I. *Of the* Ulcerative Inflammation.

A solution of continuity in any of the ſofter parts of the body, diſcharging either pus, ſanies, or any other vitiated matter, is termed *ulcer*; and when the ſame circumſtances happen to the bones, the term *carious ulcer* is adopted.

Ulcers are diſtinguiſhed by their particular characters, though it ſeldom happens that the affections are not complicated; and when we lay down rules for the management of one ſpecies of ulcer, it is generally requiſite to apply them to almoſt all others. However, the characters of moſt eminence are, the callous ulcer, the ſinuous ulcer, and the ulcer with caries of the adjacent bone: beſides this there is the putrid, the corroſive, the varicoſe, and other ulcers of a ſpecific character. Theſe have acquired their names from ſome particular affection, and we ſhall ſpeak of the treatment of them under diſtinct heads; but as the cure of ulcers forms one of the

moſt important as well as moſt difficult branches of ſurgery, we ſhall be ſomewhat particular in our account of them.

And firſt, as it is eſſentially neceſſary to our purpoſe, we propoſe to introduce (what was omitted under the head of inflammation) Mr. Hunter's account of the *ulcerative inflammation*.

After deſcribing the office of the abſorbent veſſels of the human body to be, firſt, that of taking up extraneous matter, in which is included the ſubſtances uſed for nouriſhment; ſecondly, all ſuperfluous and extravaſated matter, whether natural or diſeaſed; and, thirdly, the fat; Mr. Hunter aſſigns to them the function of, fourthly, producing a waſte of parts, in conſequence of which muſcles become ſmaller, bones become lighter, &c.

"Although," ſays he, "theſe two laſt effects were perhaps not expreſsly ſaid to be carried on by abſorption, either by veins, or any other ſyſtem of veſſels, yet we muſt ſuppoſe that was underſtood: ſo far the abſorbents have, in general, been conſidered as active parts in the animal œconomy; but from a further knowledge of theſe veſſels, we ſhall find that they are of much more conſequence in the body than has been imagined, and that they are often taking down what the arteries had formerly built up; removing whole organs, becoming modellers of the form of the body while growing; alſo removing many diſeaſed and dead parts, which were beyond the power of cure; of all which I ſhall now take particular notice.

"As theſe veſſels are productive of a vaſt variety of effects in the animal œconomy, which are very diſſimilar in the intention and effect, they may be reviewed in a variety of lights, and admit of a variety of diviſions." The author conſiders them in two views: "firſt, as they abſorb matter, which is not any part of the machine; ſecondly, as they abſorb the machine itſelf:" but for theſe particulars we refer to the *Treatiſe on Inflammation*, and ſhall here only notice ſuch parts as tend to explain the office of the abſorbents in the proceſs of ulceration.

"The proceſs of removing whole parts," ſays Mr. Hunter, "in conſequence of diſeaſe, in ſome caſes produces effects which are not ſimilar to one another; one of theſe is a ſore or ulcer, and I therefore call it ulcerative. In other caſes no ulcer is produced, although whole parts are removed, and for this I have not been able to find a term; but both may be denominated progreſſive abſorption.

"This proceſs of the removal of a whole ſolid part of the body, or that power which the animal œconomy has of taking part of itſelf into the circulation by means of the abſorbing veſſels, whenever it is neceſſary, is a fact that has not in the leaſt been attended to, nor was it even ſuppoſed; and having now been noticed, I mean to give a general idea of it. I may juſt be allowed once more to obſerve, that the oil, or fat, of animals, and the earth of bones, have always been conſidered as ſubject to abſorption; and ſome other

parts of the body being liable to waſting, have been ſuppoſed to ſuffer this by abſorption; but that any ſolid part ſhould totally be abſorbed, is a new doctrine."

This uſe of the abſorbents Mr. Hunter firſt demonſtrated, by obſerving the waſte of the ſockets of the teeth, and the removal of the fangs in the ſhedding of them.

"It may be difficult," ſays he, "at firſt to conceive, how a part of the body can be removed by itſelf; but it is juſt as difficult to conceive how a body can form itſelf, which we ſee daily taking place; they are both equally facts, and the knowledge of their mode of action would anſwer, perhaps, very little purpoſe; but this I may aſſert, that whenever any ſolid part of our bodies undergoes a diminution, or is broken in upon, in conſequence of any diſeaſe, it is the abſorbing ſyſtem which does it.

"When it becomes neceſſary that ſome whole living part ſhould be removed, it is evident that nature, in order to effect this, muſt not only confer a new activity on the abſorbents, but muſt throw the part to be abſorbed into ſuch a ſtate as to yield to this operation.

"This is the only animal power capable of producing ſuch effects, and like all other operations of the machine ariſes from a ſtimulus, or an irritation: all other methods of deſtruction being either mechanical or chemical. The firſt by cutting inſtruments, as knives, ſaws, &c.; the ſecond by cauſtics, metallic ſalts, &c.

"The proceſs of ulceration is of the ſame general nature in all caſes; but ſome of the cauſes and effects are very different from one another."

After obſerving that the knowledge of the uſe of the abſorbent ſyſtem is but of late date; and that of its different modes of action is ſtill later; we have the following remarks:

"As we know nothing of the mode of action of the mouths of theſe veſſels, it is impoſſible we can form any opinion that can be relied upon; but as they are capable of abſorbing ſubſtances in two different ſtates, that of ſolidity and fluidity, it is reaſonable to ſuppoſe that they have different modes of action; for although any conſtruction of parts that is capable of abſorbing a ſolid, may alſo be ſuch as is capable of abſorbing a fluid; yet I can ſuppoſe a conſtruction only capable of abſorbing a fluid, and not at all fitted for abſorbing a ſolid, though this is not likely; and to ſee the propriety of this remark more forcibly, let us only conſider the mouths of different animals, and I will venture to ſay, that the mouths of all the different animals have not a greater variety of ſubſtances to work upon, than the abſorbents have, and we may obſerve, that, with all the variety of mouths in different animals, this variety is only for the purpoſe of adapting them to abſorb ſolids, which admit of great variety in form, texture, &c. every one being capable of abſorbing fluid matter, which admits of no variety.

" This proceſs of the removal of parts of the body, either by interſtitial or progreſſive abſorption, anſwers very material purpoſes in the machine, without which many local diſeaſes could not be removed, and which, if allowed to remain, would deſtroy the perſon. It may be called, in ſuch caſes, the natural ſurgeon.

" It is by the progreſſive abſorption, that matter or pus, and extraneous bodies of all kinds, whether in conſequence of or producing inflammation and ſuppuration, are brought to the external ſurface; it is by means of this that bones exfoliate; it is this operation which ſeparates ſloughs; it is the abſorbents which are removing whole bones, while the arteries are ſupplying new ones; and although in theſe laſt caſes of bones it ariſes from diſeaſe, yet it is ſomewhat ſimilar to the modelling proceſs of this ſyſtem in the natural formation of bone; it is this operation that removes uſeleſs parts, as the alveolar proceſſes, when the teeth drop out, or when they are removed by art; as alſo the fangs of the ſhedding teeth, which allows them to drop off; and it is by theſe means ulcers are formed.

" It becomes a ſubſtitute in many caſes for mortification, which is another mode of the loſs of ſubſtance; and in ſuch caſes it ſeems to owe its taking place of mortification to a degree of ſtrength or vigor, ſuperior to that where mortification takes place; for although it ariſes often from weakneſs, yet it is an action, while mortification is the loſs of all action. In many caſes it finiſhes what mortification had begun, by ſeparating the mortified part.

Theſe two modes of abſorption, the interſtitial and the progreſſive, are often wiſely united, or perform their purpoſes often in the ſame part which is to be removed; and this may be called the mixed, which I believe takes place in moſt caſes, as in that of extraneous bodies of all kinds coming to the ſkin; alſo in abſceſſes, when in ſoft parts. It is the ſecond kind of interſtitial abſorption, the progreſſive and the mixed, that become moſtly the object of ſurgery, although the firſt of the interſtitial ſometimes takes place, ſo as to be worthy of attention."

Mr. Hunter obſerves, that this abſorption of whole parts, like many other animal proceſſes, ariſing from diſeaſe, would often appear to be miſchievous, by deſtroying parts which are uſeful; but notwithſtanding this, he concludes, they are intended to anſwer ſome very important end. He ſuppoſes that the parts removed have not the power of maintaining their ground, and that the proceſs in queſtion then becomes a ſubſtitute for mortification; and, " indeed," ays he, " in many ulcers, we ſhall ſee both ulceration and mortification going on, ulceration removing thoſe parts that have power to reſiſt death."

Speaking of the remote cauſe of the removal of parts of the animal, the author conſiders the ſimple intention of nature to be the removal of uſeleſs parts, as the thymus gland, membrana pupi-

laris, ductus arteriosus, the alveoli, &c. and assigns as another cause, weakness, or the want of power in the part to support itself under certain irritations. As instances of the latter, the absorption of calluses, cicatrices, the gums in salivation; also that arising from pressure, or irritating applications, are mentioned.

"From the above account," says he, "of the final cause of the absorption of whole parts from disease, it would appear that they are capable of being absorbed from five causes. First, from parts being pressed; secondly, from parts being considerably irritated by irritating substances; thirdly, from parts being weakened; fourthly, from parts being rendered useless; fifthly, from parts becoming dead. The two first, for instance, parts being pressed, and parts being irritated, appear to me to produce the same irritation; the third, or weakness, an irritation of its own kind; and the fourth, or parts being rendered useless, and the fifth, or parts becoming dead, may be somewhat similar."

Mr. Hunter's remarks on the disposition of living parts to absorb and also to be absorbed, are highly curious and deserving of attention. He divides the dispositions of the parts of the living body, which absorb, and are absorbed, into two kinds, respecting the parts, one passive, and the other active. "The first," he says, "is an irritated state of the part to be absorbed, which renders it unfit to remain under such circumstances; the second is the absorbents being stimulated to action by that particular state of parts, so that both conspire to bring about the same result.

"Many parts of our solids," says he, "are more susceptible of being absorbed, especially by ulceration, than others, even under the same or similar circumstances, while the same part shall vary its susceptibility according to circumstances.

"The cellular and adipose membranes are very particularly susceptible of being absorbed, which is proved by muscles, tendons, ligaments, nerves, and blood vessels, being found frequently deprived of their connecting membrane and fat, especially in abscesses, so that ulceration often takes a round-about course to get to the skin, following the track of the cellular membrane; and the skin itself, when the pressure is from within, is much less susceptible of ulceration than the cellular and adipose membrane, which retards the progress of abscesses, when they are so far advanced, and also becomes the cause of the skin's hanging over spreading ulcers, which are spreading from the same cause, more especially too, if the part ulcerating is an original part. Ulceration never takes place on investing membranes of circumscribed cavities, excepting suppuration has taken place; and, indeed, ulceration in such parts would be a sure forerunner of suppuration.

"New-formed parts, or such as cannot be said to constitute part of the original animal, as healed sores, calluses of bones, especially those in consequence of compound fractures, admit more readily of

abſorption, eſpecially the progreſſive, than thoſe parts which were originally formed; this ariſes, probably, from the principle of weakneſs; and it is from this too, that all adventitious new matter, as tumors, are more readily abſorbed than even that which is a ſubſtitute for the old. Thus we have tumors more readily abſorbed than a callus of a bone, union of a tendon, &c. becauſe they have ſtill leſs power than thoſe which are ſubſtitutes for parts originally formed.

"*Ulceration* in conſequence of death in an external part, takes place ſoonaſt on the external edge between the dead and the living. This is viſible in the ſloughing of parts; for we may obſerve that ſloughs from cauſtics, bruiſes, mortifications, &c. always begin at the external edge.

"An internal preſſure produced by an extraneous body, acts equally on every ſide of the ſurrounding parts, and therefore every part being preſſed alike, ought, from this cauſe alone, to produce abſorption of the ſurrounding parts equally on all ſides; ſuppoſing the parts themſelves ſimilar in ſtructure, or, which is the ſame, equally ſuſceptible of being abſorbed; but we find that one ſide only of the ſurrounding living parts is ſuſceptible of this irritation, therefore one ſide only is abſorbed; and this is always the ſide which is next to the external ſurface of the body. We, therefore, have always extraneous bodies of every kind determined to the ſkin, and on that ſide to which the extraneous body is neareſt, without having any effect, or producing the leaſt deſtruction of any of the other ſurrounding parts. From this cauſe we find abſceſſes, &c. whoſe ſeat is in, or near the centre of a part, readily determined to the ſurface on the one ſide, and not on the other; and whenever the lead is once taken, it immediately goes on. But as ſome parts, from their ſtructure, are more ſuſceptible of this irritation than others, we find that thoſe parts compoſed of ſuch ſtructure are often abſorbed, although they are not in the ſhorteſt road to the ſkin; this ſtructure is the cellular membrane, as will be taken notice of hereafter."

Mr. Hunter obſerves that the ſame principle exiſts in the progreſs of tumors; "for although," ſays he, "every part ſurrounding a tumor is equally preſſed, yet the interſtitial abſorption only takes place on that ſide next the external ſurface, by which means the tumor is, as it were, led to the ſkin; from hence we find that abſorption of whole parts more readily takes place, to allow an extraneous ſubſtance to paſs out of the body, than it will to allow one to paſs in.

"Thus we ſee, that the ſlight preſſure produced by matter on the inſide of an abſceſs has a great effect, and the matter is brought much faſter to the ſkin (although very deep) than it would by the ſame quantity of preſſure applied from without; and, indeed, ſo ſlight a preſſure from without would rather tend to have an oppoſite effect, namely, that of thickening."

The author obſerves that bones are alſo ſubject to ſimilar circum-

ſtances of ulceration; for whenever an abſceſs happens in the centre of a bone, or an internal exfoliation has taken place, the extraneous body ſtimulates the cavity, and produces a ſtate of ulceration. The application of this proceſs is curious, but not immediately to our preſent purpoſe. When this adheſive inflammation aſſumes the oſſifying diſpoſition, Mr. Hunter calls it the *oſſific* inflammation. It produces a ſpreading oſſification, like the callus formed in a ſimple fracture of a bone.

We paſs over much valuable matter in the ſections on interſtitial and progreſſive abſorption, to remark on that ſpecies which is attended with ſuppuration, or that which the author has called *ulceration*.

"I ſhall now," ſays he, "give an account of that part of the actions of the abſorbing ſyſtem, which I call *ulceration*, and which is the ſecond of our firſt diviſion, reſpecting the formation of pus, viz. that which is connected with the formation of that fluid, being either a conſequence of it, or producing it, and is that which in all caſes conſtitutes an ulcer. It is this which principally conſtitutes the progreſſive abſorption.

"This differs from the foregoing in ſome circumſtances of its operations. It either takes place in conſequence of ſuppuration already begun, and then the pus acts as an extraneous body, capable of producing preſſure; or abſorption attacks external ſurfaces from particular irritations or weakneſs, in which caſe ſuppuration, forming an ulcer, muſt follow, let the cauſe of that breach or loſs of ſubſtance be what it may."

Mr. Hunter ſays he has given it the term *ulceration*, becauſe *ulcer* is a word in uſe to expreſs a *ſore*, and becauſe it is by this proceſs that many ulcers are formed. "The operations produced in ulceration," he ſays, "have not hitherto been in the leaſt underſtood, therefore a very erroneous cauſe of theſe operations has been always ſuppoſed; namely, that thoſe ſolids which were viſibly gone, were diſſolved into pus: from hence aroſe the idea of matter being compoſed of *ſolids* and *fluids*," which Mr. Hunter has endeavoured, in the courſe of the work, to diſprove.

"The proceſs of ulceration which brings matter to the external ſurface is not wholly the abſorption of the inner ſurface of the abſceſs, for there is an interior or interſtitial abſorption of the parts lying between the inner ſurface of the abſceſs and the ſkin, ſimilar to the approach of incyſted tumors, as has been deſcribed. And beſides this aſſiſtance, I have already obſerved, there is a relaxing and elongating proceſs carried on between the abſceſs and the ſkin; and at thoſe parts only where the matter appears to point.

"This proceſs of ulceration, or abſorption, with ſuppuration, is almoſt conſtantly attended by inflammation; but it cannot be called an original inflammation, but a conſequent, which gave riſe to the term ulcerative inflammation. It is always preceded by the adheſive inflammation, and perhaps it is ſimply this inflammation which attends it; we find the adheſions produced anſwering very wiſe

purpoſes; for, although the adheſive inflammation has preceded the ſuppurative, and of courſe all the parts ſurrounding the abſceſs are united, yet, if this union of the parts has not extended to the ſkin, where the abſceſs or matter is to be diſcharged, in ſuch a caſe, wherever the ulceration has proceeded beyond the adheſions, there the matter will come into unadhering parts; the conſequence of which will be, that the fluid, or matter, will diffuſe itſelf into the cellular membrane of the part, and from thence over the whole body, as in the eryſipelatous ſuppuration; but to prevent this effect, the adheſive inflammation takes the lead of ulceration. There are many other cauſes of ulceration, which take place on ſurfaces, where we do not ſee the ſame neceſſity for it; when the matter formed can be, and is diſcharged without it; ſuch parts are many old ſores; the inſide of the ſtomach and inteſtines; and indeed all the ſurfaces above mentioned, which do not admit readily of the adheſive inflammation, under ſome circumſtances admit of the ulcerative. This effect would appear to ariſe from the violence of the inflammation, the parts being ſo weakened, either by it, or ſome former diſeaſe, that they can hardly ſupport themſelves; for we find in ſalivations, where the whole force of the mercury has been determined to the mouth, they have become weakened by long and violent action; the gums and inſide of the mouth will ulcerate; alſo, from the ſame weakening diſpoſition, the gums will ulcerate in bad ſcurvies; therefore weakneſs joined with inflammation, or violence of action, appears to be the immediate cauſe in ſuch caſes.

"The effect then of irritation, as above deſcribed, is to produce firſt the adheſive inflammation in ſuch parts as will readily admit of it, and if that has not the intended effect, the ſuppurative takes place, and then the ulceration comes on to lead the matter already formed to the ſkin, if it is confined.

"The natural conſequence of ſuppuration in ſuch parts, is the growth of new fleſh, called *granulations*, which are to repair the loſs the parts ſuſtained by the injury done; but in all outlets, where the adheſive would be hurtful, the irritation firſt only produces the ſuppurative inflammation; but if carried further, the adheſive will take place, as has been deſcribed; and, as in ſuch parts the matter formed has an outlet, ulceration is alſo avoided; and, as in ſuch caſes no parts are deſtroyed, granulations are alſo excluded."

Mr. Hunter notices a curious circumſtance attending ulceration, namely, the readineſs with which it ſeems to abſorb every other ſubſtance applied to it, as well as the body itſelf. He inſtances this in the ſmall-pox after inoculation; and alſo in the venereal chancre.

"From what has been obſerved," continues he, "it muſt appear that any irritation which is ſo great as to deſtroy ſuddenly the natural operations of any one part, and the effect of which is ſo long continued as to oblige the parts to act for their own relief, produces

in ſome parts, firſt the adheſive inflammation; and if the cauſe be increaſed, or continue ſtill longer, the ſuppurative ſtate takes place, and all the other conſequences, as ulceration; or, if in the other parts, as ſecreting ſurfaces, then the ſuppurative takes place immediately; and if too violent, the adheſive will ſucceed; or if parts are very much weakened, the ulcerative will immediately ſucceed the adheſive, and then ſuppuration will be the conſequence.

"This ſpecies of ulceration in general gives conſiderable pain, which pain is commonly diſtinguiſhed by the name of ſoreneſs; this is the ſenſation ariſing from cutting with an inſtrument, which operation is very ſimilar to ulceration; but this pain does not attend all ulcerations, for there are ſome of a ſpecific kind, which give little or no pain, ſuch as the ſcrofula; but even in this diſeaſe, when the ulceration proceeds pretty faſt, it gives often conſiderable pain; therefore the pain may be in ſome degree proportioned to the quickneſs of its operation.

"The greateſt pain which in general attends this operation ariſes from thoſe ulcerations which are formed for the purpoſe of bringing the matter of an abſceſs to the ſkin; as alſo where ulceration begins upon a ſurface, or is increaſing a ſore. Whether the increaſe of pain ariſes from the ulcerative inflammation ſingly, or from the adheſive and ulcerative going on together in the ſame point, is not eaſily determined; but in ſome caſes theſe three are pretty rapid in their progreſs, and it is more than probable that the pain ariſes from all theſe cauſes.

"In thoſe caſes where ulceration is employed in ſeparating a dead part, ſuch as ſloughing, exfoliation, &c. it is ſeldom attended with pain; perhaps it may not be eaſy to aſſign a cauſe for this."

Mr. Hunter obſerves that it is eaſy to diſtinguiſh between a ſore that is ulcerating, and one which is granulating, or ſtationary.

"The ulcerating ſore is made up of little cavities or hollows, and the edge of the ſkin is ſcolloped or notched; is thin, turned a little out, and overhangs, more or leſs, the ſore. The ſore is always foul, being probably compoſed of parts not completely abſorbed; and diſcharges a thin matter.

"But when the ulceration ſtops, the edge of the ſkin becomes regular, ſmooth, a little rounded or turned in, and of a purple colour, covered with a ſemi tranſparent white."

The author ſpeaks of what he calls "the relaxing proceſs," in the following way:

"Beſides theſe two modes of removing whole parts," ſays he, "acting ſingly or together, there is an operation totally diſtinct from either, and this is a relaxing and elongating proceſs, carried on between the abſceſs and the ſkin, and at thoſe parts only where the matter appears to point. It is poſſible that this relaxing, elongating, or weakening proceſs may ariſe in ſome degree from the abſorption of the interior parts; but there is certainly ſomething more, for

the ſkin that covers an abſceſs is always looſer than a part that gives the way from mechanical diſtenſion, excepting the increaſe of the abſceſs is very [illegible].

"That parts [illegible], or elongate, without mechanical force, but from particular ſtimuli, is evident in the female parts of generation, juſt before the birth of the fœtus; they become relaxed prior to any preſſure. The old women in the country can tell when a hen is going to lay, from the parts becoming looſe about the anus."

Mr. Hunter's *illuſtrations of ulceration* are particularly curious; we ſhall therefore gratify the reader by inſerting them fully in his own words.

"Now that I have been endeavouring," ſays he, "to give ideas of the effects of inflammation, viz. adheſion, ſuppuration, and ulceration, let me next mention ſome caſes which frequently occur, as illuſtrations, which will give a perfect idea of theſe three inflammations: and, for the clearer underſtanding them, I ſhall illuſtrate them upon the inflammation, ſuppuration, and ulceration, of the large circumſcribed cavities. For inſtance, an inflammation attacks the external coat of an inteſtine; the firſt ſtage of this inflammation produces adheſions between it and the peritoneum lining the abdominal muſcles: if the inflammation does not ſtop at this ſtage, an abſceſs is formed in the middle of theſe adheſions, and the matter acts as an extraneous body; the abſceſs increaſing in ſize from the accumulation of matter, a mechanical preſſure is kept up, which irritates, and the ſide next the ſkin is only ſuſceptible of the irritation; this irritation not deſtroying the diſpoſition to form matter, ſuppuration is ſtill continued, and the ulcerative inflammation takes place.

"If ſuppuration began in more parts of the adheſion than one, they are commonly united into one abſceſs; an abſorption of the parts between the abſceſs and the ſkin takes place, and the matter is led on to the external ſurface of the body, where it is at laſt diſcharged.

"If the diſpoſition for ulceration was equal on every ſide of the abſceſs, it muſt open into the inteſtine, which is ſeldom the caſe, although it ſometimes does; for the ſame precautions are not taken here as in many other ſituations; for in ſome others, as in the noſe, in the caſe of an abſceſs of the lachrimal ſac, the paſſage is thickened towards the noſe. In the caſe above deſcribed, however, the abdominal muſcles, fat, and ſkin, are removed, rather than the coats of the inteſtine. Facts of this kind have come under my own obſervation.

"In this caſe, if adheſions had not preceded ulceration, the matter muſt have been diffuſed over the whole cavity of the belly; if the adheſive inflammation had not likewiſe gone before the ulceration in the abdominal muſcles, &c. the matter would have found a free paſſage from the abſceſs into the cellular membrane of the

abdomen, as soon as the ulceration had got through the first adhesions, as is often the case in erysepelatous suppurations.

"Abscesses between the lungs and the [illegible]ra, in the liver, gall-bladder, &c. rise to the surface from [illegible]me cause; also in lumbar abscesses, where one would at first imagine the readiest place of opening would be the cavity of the abdomen, or gut; the parts nearest to the skin are removed, and the matter passes out that way; however, in abscesses so very deep, it does not always happen that one side only is susceptible of the irritation, and we shall find that the matter is taking different courses.

"Abscesses in the substance of the lungs sometimes differ from the above-described; for they sometimes open into the air-cells: it is, because the adhesive inflammation finds it difficult to unite the air-cells, and branches of the trachea (as was described in treating of that inflammation), and also in the substance of the lungs, it may be difficult to say where it can take a lead externally, from which, probably, the air-cells become similar to an external surface, and then ulceration takes place on that side of the abscess which is nearest to the cells; therefore we find that the matter gets very readily into the air-cells, and from thence into the trachea.

"That the air-cells do not take on the adhesive state is evident in most abscesses in this part; for we find, in most of those cases, that the air-cells are exposed, as also the branches of the trachea, and the parts of the lungs which compose this abscess have not the firmness and solidity which the adhesive inflammation generally produces in those parts where it takes place.

"Thus too we find it going on in large abscesses, even after they have been opened, but are so situated or circumstanced as to have some part of the abscess, on that side immediately under the skin, pressed by some other part of the body which lies underneath. For instance, when a large abscess forms on the outer, and upper part of the thigh, opposite the great trochanter, which is a very common complaint, and an opening is made into it, or it bursts below, or on the side of that bone, but not directly opposite to the trochanter itself; in such cases it frequently happens, that the pressure of the trochanter on the inside of the abscess, viz. the cellular and adipose membrane and the skin covering the trochanter, that this pressure produces ulceration of these parts; which process is continued on through the skin, and makes a second opening directly upon the trochanter.

"It is curious to remark, how these processes of nature fulfil their appointed purposes, and go on no further; for any young flesh, or granulations, which may have formed upon the trochanter, which very often happens before this ulceration is completed, yet these do not ulcerate, although the pressure was as great, or greater, upon them than it was upon the parts which gave way.

"This is upon the principle, that pressure from without has not

the ſame effect as within. The fiſtula lachrymalis is another ſtrong proof of ulceration only taking place towards the external ſurface, and ſecuring the deeper-ſeated parts; as alſo the ulceration in conſequence of matter in the frontal ſinuſes.

"An effect of the ſame kind we have obſerved in milk-breaſts. In theſe caſes the ſuppuration commonly begins in many diſtinct portions of the inflamed parts, ſo that it is not one large circumſcribed abſceſs, but many ſeparate ſinuſes are formed, all of which generally communicate: now it uſually happens, that only one of theſe points externally; which being either opened or allowed to break, the whole of the matter is to be diſcharged this way; but it frequently happens, that the matter does not find a ready outlet by this opening, and then one or more of theſe different ſinuſes make diſtinct openings for themſelves; which ſhows how very eaſily the ſlight preſſure of ſuch a trifling confinement of matter can produce the ulcerative inflammation. Ulceration is therefore no more than an operation of nature to remove parts out of the way of all ſuch preſſure as the parts cannot ſupport; and, accordingly, it begins where the greateſt preſſure is felt, joined with the nature of the parts and its vicinity to the ſkin.

"It is curious to obſerve, that the ulcerative proceſs has no power over the cuticle, ſo that when the matter has got to that part it ſtops, and cannot make its way through, till the cuticle burſts by diſtenſion; but in general the cuticle is ſo thin as to give but very little trouble: however, in many places, it is ſo thick as to be the cauſe of very troubleſome conſequences."

Mr. Hunter here obſerves on the thinneſs of the cuticle, that this is the reaſon why many abſceſſes in the palms of the hands, ſoles of the feet, fore part of the fingers, and about the nails commonly called whitloes, &c. more eſpecially in working people, give ſo much pain in the time of inflammation, and are ſo long in breaking, even after the matter has got through the cutis to the cuticle; the thickneſs of the cuticle, as alſo the rigidity of the nail, acting in thoſe caſes like a tight bandage, which does not allow them to ſwell or give way to the extravaſation; for in the cuticle there is not the relaxing power, which adds conſiderably to the pain ariſing from the inflammation; but when the abſceſs has reached to this thick cuticle it has no power of irritation, and therefore acts only by diſtenſion; and this is in moſt caſes ſo conſiderable, as to produce a ſeparation of the cuticle from the cutis, for a conſiderable way round the abſceſs; for he has obſerved, when treating on inflammation, that it commonly produced a ſeparation of the cuticle; all of which circumſtances taken together, make theſe complaints much more painful than a ſimilar ſized abſceſs in any other ſoft part. The application of poultices, in theſe caſes, Mr. Hunter ſays, is of more benefit than any other, becauſe here they can act mechanically, viz. the moiſture being imbibed by the cuticle, as in a

ſponge, and thereby ſoftening the cuticle, by which means it becomes larger in its dimenſions, and leſs durable in its texture. The abſceſs ſhould be opened as ſoon as poſſible, to avoid the pain ariſing from diſtenſion, and the ſeparation of the cuticle; when it is conceived it means to point at any one part. Paring off the thick cuticle near the cutis, is allowing the matter to make its eſcape more readily, when it has got through the cutis. There is a circumſtance which almoſt always attends the opening ſuch an abſceſs, viz. the ſoft parts underneath puſh out through the opening in the cuticle, like a fungus, which, when irritated from any accident, give a greater idea of ſoreneſs, perhaps, than any other morbid part of the machine ever does: this is owing to the ſurrounding belts of cuticle not having given way to the increaſe of the parts underneath, by which means they are ſqueezed out of this ſmall opening, like paint out of a bladder. It is a common practice to eat this down by eſcharotics, as if it was a diſeaſed fungus; but this additional pain is very unneceſſary, as the deſtroying a part which has only eſcaped from preſſure, cannot in the leaſt affect that which is within; and by ſimply poulticing till the inflammation, and of courſe the tumefaction, ſubſides, theſe protruded parts are gradually drawn into their original ſituations. Mr. Hunter then continues:

"Thus far I have conſidered ulceration as ariſing from viſible irritations, joined with a ſuſceptibility of the parts for ſuch particular irritation; but, beſides thoſe above deſcribed, we often have inſtances of ulceration taking place from a diſpoſition in a part, and where, perhaps, no reaſon can be aſſigned, but weakneſs in the part. I obſerved before, that ſome parts of the body were more ſuſceptible of ulceration than others. I then ſpoke of original parts; but I now remark that, newly-formed parts are much more ſuſceptible of ulceration than the original; ſuch as cicatrices, granulations, calluſes, &c. for we find this diſpoſition often taking place in old cicatrices from very ſlight cauſes, ſuch as irregularity in the way of life, or violent exerciſe (which is ſeen every day in our hoſpitals), where the parts ſeem incapable of ſupporting themſelves. Remarkable inſtances of this are recorded in Anſon's Voyages, where the habit was ſo much debilitated, as to allow all the old ſores to ulcerate, or break out anew; the calluſes were abſorbed and taken into the circulation: and we alſo find, that all theſe parts perform the operation of ſloughing when dead, much ſooner than original parts.

"Now it is evident, in theſe caſes mentioned in Anſon's Voyages, that the whole frame of body was weakened by the hardſhips ſuffered in this expedition; and that the young, or new-formed ſubſtances would ſuffer in a greater degree, ariſing from their being leſs firm and fixed than that which had been an original formation, and ſubſiſted from the firſt; and, as no repaired parts

are endowed with the powers of action or reſiſtance, equal to an original part, it is no wonder that this new fleſh, ſharing in the general debility, became incapable of ſupporting its texture: perhaps a very ſenſe of this debility proved an irritation, or the cauſe of that irritation which produced the abſorption of parts; however that may be, it is a general fact, that parts which are not originally formed, commonly give way ſooner in depravations of the habit: in like circumſtances, alſo, old ſores that are healing, will break out, ſpread, and undo, in twenty-four hours, as much of the parts as had been healing in ſo many weeks."

From theſe obſervations it is evident, that new-formed parts cannot reſiſt the power of many diſeaſes, nor ſupport themſelves under ſo many ſhocks, as parts that are originally formed.

Mr. Hunter farther obſerves, that "Although a part is loſing ground or ulcerating, yet it continues ſuppurating: for while a matter-forming ſurface is ulcerating (whether an original-formed part of the body, ſuch as in moſt abſceſſes, or a new-formed ſubſtance, ſuch as granulations) we find that it ſtill ſecretes pus." He concludes this part of his ſubject by ſaying, that "In ſuch caſes the adheſive inflammation proceeds very rapidly, and would ſeem to prepare the parts, as it goes for immediate ſuppuration the moment they are expoſed."

In the *diviſion of ulcers* we ſhall uſe that very general one of *local* and *conſtitutional*; the former exiſting merely in conſequence of ſome external exciting cauſe being continued, and counteracting the efforts of nature to remedy the evil; the latter ariſing from, or at leaſt, being prolonged by, ſome conſtitutional affection. A common wound, degenerated from its original ſimple healthy ſtate, into an habitual, complicated, morbid one, furniſhes an example of the former kind; and that ſpecies of ulcer, called ſcrofulous, which ariſes ſpontaneouſly, and is curable only by remedies that act on the ſyſtem, may be cited as an inſtance of the latter.

The local ulcer, exiſting on any other part of the body except the legs, is far from being unmanageable, or difficult of cure. It, in fact, requires nothing but a daily renewal of ſome kind of ſimple dreſſing, leſs with the poſitive intention of promoting the reſtoration of the part, than with the negative one of preventing any impediment to the ſalutary operations of nature. But the ulcer of the lower extremity, is the formidable diſeaſe with which we have to contend. It is this which is, perhaps, the moſt frequent of any chirurgical complaint, which too often baffles the exerciſe of our art, and which, when cured, very commonly returns; inſomuch, that the ulcer of the leg may, without any great violation of propriety, be conſidered as a diſeaſe *ſui generis*.

It has employed the conjectures of many ingenious men, to aſſign cauſes for the frequency, as well as the obſtinacy, of this

complaint.—Many may, undoubtedly, concur, some too which are unknown; for of causes we know little.

Mr. Underwood attempts to solve the difficulty, by calling our attention, first, to the natural languid state of the circulation in parts situated at such a distance from the heart; by which, the vital energy in them being diminished, the healing powers that depend upon it, must also of consequence be weakened. Secondly, he considers as a material impediment to the success of our treatment, the natural structure of the parts, which consist much of tendinous and ligamentous substances, possessing a small share of irritability, and not easily excited to that degree of healthy action which the case requires.

But it has been asserted by some, and implicitly believed by many, that, admitting it were more practicable than it really is, to heal an old ulcer of the leg, the practice is *not a safe one*.—Let us stop here to consider this opinion.

It is undoubtedly true, in point of fact, that persons who have for many years laboured under this disease, and especially at an advanced period of life, have suffered considerable inconvenience from the healing of an ulcer. We are forbidden by Mr. Hunter to suppose, that the ulcer, in the time of its existence, *drained* the constitution of something that had a morbid tendency, and required an outlet: yet, that must either have been the case, or we must admit, that the solids underwent a peculiar and *salutary action* whilst the ulcer existed, which the constitution would not consent to be deprived of. However this be, certain it is, that when a large and long existing ulcer has been brought nearly to the point of healing, or become actually healed, it is not very uncommon for the patient to be attacked with febrile symptoms, or with some affection of the stomach or bowels, during the existence of which, the ulcer has shewn a disposition to enlarge. Some old persons have even, it is said, become paralytic under the like circumstances.

Experience, however, has shewn, that whether these mischievous effects arise or not after the healing of an old ulcer, they arise, at least, in very few instances; so few, indeed, as by no means to impugn what is now a pretty general practice, *to heal the ulcer whenever it is possible*, without attending to what may be *the consequence*.

But, indeed, whenever these inconveniences do occur, they are, in most instances, capable of being done away by venesection, by the administration of emetics, saline or drastic purgatives, or the bark; or, in some cases, by a blister applied to a distant part.

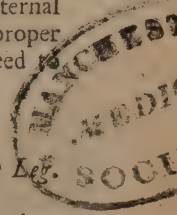
On the first occurrence of unfavourable symptoms, or before they have taken place, the common, and certainly a good preventive remedy, is the opening an issue, on the inside, and immediately below, the knee of the diseased extremity. This, in a great

meaſure, ſupplies a ſubſtitute for that ſort of *action, or that ſort of drain,* to which the patient's conſtitution has been familiar, and the ulcer, in many inſtances, will remain permanently healed.

Whilſt we are on this ſubject, it may not be improper to mention an inſtance, adduced by a late eminent practitioner, of an ulcer in the leg, cauſed by the imprudent ſuppreſſion of an habitual perſpiration in the ſoles of the feet. The ulcer, after having ſubſiſted ten years, was healed by the perſpiration of the feet being brought on again; and a relapſe was alſo prevented, by the uſe of a ſtocking made of the common ſilk oil-ſkin.

That a languid degree of circulation is among the principal cauſes of the ulcer of the leg is farther confirmed by the well-known fact—that women, who are more debilitated than men, are more liable than the latter to this troubleſome diſeaſe. Another proof is, the frequency of the diſeaſe in the lower claſs of people, who, from the ſcantineſs of their food, are not ſufficiently nouriſhed. On their coming into an hoſpital, where they enjoy a better and more nouriſhing diet, it is remarkable how ſoon an advantageous change takes place in the ulcer, which heals, and would, perhaps, remain cured, but that, on returning once more to their uſual way of living, they become ſubject to a renewal of the complaint.

In treating on ulcerated legs, moſt writers require an attention to the following circumſtances:—1ſt, Abſolute reſt, and an horizontal poſition of the limb; 2dly, The proper choice of internal remedies; 3dly, The application of a bandage; 4thly, The proper choice of topics to the ulcer. Of theſe we ſhall now proceed to ſpeak nearly in the order in which they ſtand.



Sect. II. *Of the Neceſſity of Reſt in the Cure of Ulcers of the Leg.*

When an ulcer is formed on the leg, and the part is in an irritable and inflamed ſtate, it is very natural to ſuppoſe, that motion muſt tend greatly to augment the miſchief; and that it actually does ſo, we have repeated and melancholy proofs, amongſt the labouring poor, who cannot poſſibly find thoſe opportunities of remaining at reſt that their unfortunate caſes require. This it is, joined to the cauſes of debility already enumerated, and we may add, the too prevalent uſe of ſpirituous liquors, that occaſions the moſt inconſiderable loſs of ſkin, perhaps, to degenerate into an ulcer of the moſt formidable kind.

If ſuch then be the effects of exerciſe on an ulcer, it would ſeem, *à priori*, that reſt muſt be indiſpenſably neceſſary in attempting its cure. But ſome writers, nevertheleſs, have advanced a contrary opinion, and one in particular not only denies the neceſſity of abſolute reſt, and an horizontal poſition of the leg, but even

attributes the frequent return of ulcers to the practice of curing them under those circumstances. The great substitute for rest, and an horizontal posture, is a bandage of thin flannel, so applied as to produce an uniform degree of pressure from the ancle upwards to the knee. This, by embracing the debilitated parts, contributes to benefit the ulcer not less than the relative confinement of the muscles of the limb, which the patient uses more like an artificial leg than a real one, since the whole moves forward together in walking, whilst the muscles, with regard to *each other* are nearly quiescent. The injurious tendency of an upright posture, being also obviated by the use of a bandage, may be accounted for upon a principle by no means irreconcileable to that from which the practice openly professes to deviate. For what is the effect of an horizontal position of the limb, but that of taking off the perpendicular pressure of the blood upon the weakened vessels? What is the effect of an elastic roller covering the whole leg, but that of sustaining the vessels, and enabling them, without injury, to support that pressure? In the former case, we hinder the pressure, in the other, we apply a resisting body, which enables the parts to bear it.

To the advantages of the latter system may be added, the general benefit which the constitution must derive from exercise, the want of which, in the other case, disposes the patient to general, and therefore to a certain degree of local debility, prejudicial to the end we have in view. The circulation is also said to be invigorated in the limb, and the process of restoration forwarded, by the use of a bandage; but this subject we shall discuss in another place.

Sect. III. *Of the Treatment of Ulcers by internal Remedies.*

In the treatment of ulcers that are merely *local*, it is not to be supposed, that the use of internal remedies can be very strongly indicated. Yet, in cases where not only local, but general debility, prevail, a very salutary degree of vigour may be imparted to the constitution, by the exhibition of bark and other tonic remedies. To the Peruvian bark, indeed, some have attributed good effects, independent of its bracing quality; and have expected from its use, a sort of specific operation in amending the discharge of an ulcer, and lessening its irritability. But the best attested cases do not seem to prove, that any thing beyond the virtues of a tonic, can justly be attributed to the bark.

It is now a considerable time since practitioners have proved, by very full and repeated trials, the total inefficacy of some other internal remedies, which it was the fashion of the day to extol. Among these particularly was nitre; pushed, as it were, into vogue by bold assertions in its behalf, and supported in its pretensions to infallibility by the apparently *secondary* aid of a bandage, which, no

doubt, had an honeſt and excluſive claim to the meritorious character, attempted, for obvious reaſons, to be attached to its companion.

Little more than this can be ſaid in favour of an internal remedy, uſhered into practice with ſtill greater formality than the preceding, and with favourable atteſtations even from men of high reputation in the profeſſion, to wit, hemlock. Whatever we may be inclined to grant to this remedy, when employed in the treatment of ulcers manifeſtly depending on a particular ſtate of the conſtitution, we can by no means allow it any importance in the treatment of an ulcer merely local in its nature. It may, indeed, by leſſening the irritability of the whole ſyſtem, ameliorate the ſtate of the ulcer in that ſingle particular; yet, even that effect muſt be trivial when obtained by ſo circuitous a channel, and may be more advantageouſly attempted in the way of a topic, in which, indeed, it is entitled to ſome ſhare of approbation, as we ſhall have occaſion to mention hereafter.

It is almoſt ſuperfluous to dwell on this ſubject, ſince, certainly, we are poſſeſſed of few, if any, internal remedies, that are efficacious in the kind of ulcer of which we are now treating. Yet, if facts, not reconcileable to any exiſting theory, poſſeſs any value, we may venture to mention the internal uſe of the *hydrargyrus muriatus*, a remedy which in ſome inſtances has certainly been of ſervice, and eſpecially when adminiſtered at the ſame time with the Peruvian bark.

There is another internal remedy, indeed, which applies to thoſe ulcers common in the legs of women whoſe menſtrual evacuations have been ſuſpended; and that is *iron*. This, it muſt be confeſſed, is not merely uſeful, but indiſpenſably neceſſary; as tending to remove the apparent cauſe of the ulcer, which, in general, cannot be cured till the menſtrual evacuations are reſtored. In the view of counteracting general debility too, this remedy is at leaſt equal to any other tonic. The *vitriolated iron* is, perhaps, the moſt eligible preparation of that metal, and it may be very properly adminiſtered at the ſame time with the bark.

The laſt claſs of internal remedies, of which it is neceſſary to ſpeak, is the *cathartic*. In rural ſituations, where ſurgeons often have to do with vigorous ſubjects, prone to inflammation, the neceſſity of evacuating the inteſtines occaſionally, is clearly indicated. Hence, when the ſtate of the patient's general habit, and of the ulcer, is oppoſite to that of debility, it is an advantageous practice, to adminiſter occaſional doſes of neutral ſalts. But many of ſuch caſes are more effectually relieved by *keeping* the bowels in a lax ſtate, by daily doſes of a ſolution of ſalts, to each doſe of which, a quarter, or one-ſixth of a grain of tartarized antimony is joined.

It muſt not, however, be ſuppoſed, that becauſe the uſe of cathartic remedies is occaſionally beneficial, that their adminiſtration

is to be encouraged as an indiscriminate practice. Experience certainly proves the contrary; and even, that in many instances they are hurtful by inducing both general and local debility.

We shall here add a suggestion drawn from a late periodical work, in which it is observed, that, "Among the internal remedies that have been lately proposed, and often employed with success by physicians on the continent, is the extract of the wild hyssop (*gratiola officinalis, Linn.*); by which, according to the account given by Dr. Wendt, four persons have been cured of inveterate ulcers of the legs, attended with a discharge of ichorous matter. Dr. Wendt, however, adds, that patients subject to hæmorrhages, particularly women during menstruation, ought, under these circumstances, to abstain from the use of this extract; and others of a cachectic disposition, which is generally prevalent in these complaints, should take it at night only; for, if used in the morning, it is apt to occasion violent purging and vomiting. The most proper method of administering it, is that of diluting two drachms of the extract of gratiola (which is easily prepared by inspissating a strong decoction of the flowers of the hyssop to the consistence of a thick syrup) with four ounces of water, and directing the patient to take at first one tablespoonful at night, to increase the dose gradually to two tablespoonfuls; and then to begin likewise to take a spoonful of this draught every morning. In that stage of pulmonary consumption which arises from the absorption of pus from large suppurating ulcers, and the subsequent hectic fever, it is confidently affirmed, that the prudent use of the extract of gratiola has frequently afforded unexpected relief, when there was little hope of the patient's recovery."

While on the subject of internal remedies, there can be no impropriety in our adding a few observations on the subject also of diet, which many suppose should be considered as one of the class. As errors in diet, more particularly the inordinate use of spirituous liquors, are justly ranked by many amongst the causes of ulcerated legs, or, at least, among the most material impediments to their cure, it is very natural to suppose that some strict regulation in the choice of our food must be of importance where an ulcer is to be treated. Much, however, as this may seem conformable to probability, it is certainly by no means agreeable to experience; for the most minute attention, in avoiding what has been thought pernicious, has, in no instance on record, produced such effects as to render the diet of patients with ulcerated legs an object of consideration, farther than the preserving it within the line of strict temperance.

Where we have to contend with inflammation, indeed, we well know the propriety of using diluents, and avoiding animal food, and stimulants of every description; and where debility prevails, we can decide, with equal facility, on the impropriety of a low re-

gimen: beyond this our obſervations degenerate into mere trifling; and we uſeleſsly deprive our patients of many uninjurious gratifications of the appetite by the reſtraints we impoſe.

Sect. IV. *Of the conſtitutional Complaints which ſometimes accompany ſimple Ulcers of the Leg.*

The frequent failure in the attempt to cure ulcers, of the lower extremities in particular, has by many been conſidered as an opprobrium to the faculty. Thoſe who are unacquainted with the laws of the animal economy, as well as with the difficulties which medical practitioners experience, in aſcertaining the origin or cauſe of diſeaſes among patients of a certain deſcription, will not paſs ſo haſty a judgment.

It ſometimes happens, that patients who have ulcerated legs are at the ſame time troubled with phthiſical ſymptoms, as a cough, night-ſweats, and hectic paroxyſms.

In theſe caſes, however, the ſtate of the ulcer may ſeem to demand invigorating remedies, and a generous diet, we muſt be extremely circumſpect in our uſe of ſtimulants, either in the form of aliment or medicine. Iron, it is probable, will be improper, ſince the irritability is greatly increaſed in ſuch patients. So, indeed, will ſtimuli of almoſt every deſcription; and even the bark, which is too apt to increaſe affections of the cheſt, will require to be employed with the utmoſt circumſpection.

In a caſe of this ſort, however, we may very properly give gentle emetics, repeated at proper intervals, and followed by warm purgatives. As the ſtomach never fails to be a good deal affected, the former are attended with the beſt conſequences; and will, in general, ſo far remove the cough, as to enable us to adminiſter with ſafety ſome weak preparation of the bark, with the vitriolic acid, to abate the night-ſweats. A ſolution of *vitriolated zinc* is particularly ſerviceable in ſuch caſes as a vomit.

Country air is above all things material; for it is, in general, the want of a pure atmoſphere that ſo commonly occaſions hectic ſymptoms in patients ſituated in crowded hoſpitals and workhouſes. In ſuch, where the general health is much impaired, ulcers, however carefully attended to, either remain ſtationary, or become worſe; ſo neceſſary is it, to enſure any degree of ſucceſs in their treatment, that the patient ſhould have, at leaſt, a tolerable ſhare of conſtitutional energy. The treatment of *hectic*, however, when it occurs, will be found under its proper head in our firſt volume.

Sect. V. *Of the Treatment of Ulcers by topical Remedies.*

With regard to topical applications for common ulcers, it is impoſſible to lay down any certain rules for the ſelection of them. The ſurgeon who imagines he can cure all ulcers by a dreſſing of one particular kind, or by any particular manner of applying it, will find himſelf egregiouſly miſtaken.

In treating an ulcer with topical remedies, we ſhould have two intentions in view; 1ſt. Whatever be the condition in which we find an ulcer, to bring it into ſuch a ſtate as ſhall diſpoſe it to heal. 2dly. To heal or cicatrize it permanently.

In purſuing the firſt intention, we ſhall find ourſelves occaſionally very much at a loſs. In a great many caſes, it will be found neceſſary to deſtroy the old ſurface of the ulcer, and to expoſe a new one; and it is with this view, that an author, who has profeſſedly written on the ſubject, and before him the excellent Wiſeman, have recommended *filling up* the ſore with red nitrated quickſilver, and repeating this proceſs till a clean and healthy ſurface is exhibited. Where the ulcer is of an inconſiderable ſize, this practice no doubt is to be commended; but in very large ulcers, or ſuch as extend over the greater part of the leg, of which we ſee many inſtances, this plan cannot be purſued.

Patients of the poorer claſs, amongſt whom, unhappily, ulcers of the legs are moſt prevalent, having no leiſure to attend to the means neceſſary for their cure, uſually have their ſores in a filthy and putrid ſtate. This it is obviouſly neceſſary to remedy, by ſoaking and waſhing the parts in warm water; by the application of lint once a-day, or oftener, according to the quantity of diſcharge; and by a conſtant renewal of the cloths and bandages.

Cleanlineſs is one among the moſt important advantages of *fomenting* ulcers; though, in this form, it is certain many topics may be applied in a curative point of view. Where an ulcer is inflamed, we may apply emollients; where it is in an irritable ſtate, we may uſe ſedatives, as a fomentation of poppies; where it is putrid, we may uſe decoctions which have a tendency to reſiſt putrefaction; and where an ulcer is of the languid deſcription, we can apply ſtimulants. Warm fomentations have a good effect, not on the ulcer alone, but likewiſe on the ſurrounding parts which are ſoftened and relaxed, and the circulation promoted through the thick and callous edges which uſually encompaſs thoſe ulcers that have exiſted long. But, on the other hand, there are inſtances where this relaxing effect is diſadvantageous, as where the ulcer is diſpoſed to fungate, and its ſurface appears rather redundant, and of a looſe texture. Theſe, it is highly neceſſary that the ſurgeon ſhould diſtinguiſh; ſince ſuch will, probably, be more benefited by applying cold water than hot.

Another thing that ought, perhaps, to be regarded, is the degree of heat which is moſt ſuitable to the deſign of a fomentation. This circumſtance is not enough attended to, but the practice too commonly followed, is that of applying it as *hot* as the patient can bear. The deſcription of ulcer of which we laſt ſpoke, and no doubt many others, cannot but be moſt materially injured by ſuch a kind of application. It is probable too, that the irritable ulcer would be particularly liable to ſuffer by it; for the degree of heat, acting as a violent ſtimulant, muſt, of courſe, be diſadvantageous where every thing ſtimulating is contra-indicated. It is not neceſſary to dwell, indeed, on this ſubject, ſince the bare mention of it will be ſufficient to put the ſurgeon on his guard, and to induce him to caution thoſe to whoſe management this part of the treatment of an ulcer belongs, to act only as circumſtances require.

By the ſame rule which directs us in the choice of the materials for a fomentation, ſhould we be guided alſo in directing the ingredients for a *poultice*; which is another very material agent in the treatment of ulcers. Where the intention is that of a ſimple emollient, a bread and water poultice, with a little linſeed meal, is ſufficient. Where irritability is to be diminiſhed, a poultice, prepared with the decoction of poppies, or of hemlock, with bread and linſeed, is the moſt eligible. Where ſtimulants are wanting, we have the cataplaſma cumini, and other ſimilar remedies (ſet forth in the Pharmacopœia Chirurgica) in abundance; and ſo on, as the judgment of the ſurgeon will moſt naturally dictate. One thing, however, is to be obſerved, that theſe fomentations and poultices, though evidently uſeful on their firſt application to ulcers, ſhould not be continued too long. When once the effect of relieving the pain of the ulcer, and cleanſing it, is obtained, unleſs their farther continuance be plainly indicated, they muſt be left off; for, if continued longer than is requiſite, they either bring on debility, or increaſe it if already exiſting, and ultimately impede the cure. If, after the uſe of them, the ſore ſhould appear florid, and full of healthy granulations, nothing more will be neceſſary, perhaps, to complete the cure, than a ſlight inactive ſuperficial dreſſing, and the uſe of a bandage. In the courſe of the treatment, we need never be anxious to wipe the ſurface of the ſore, particularly if the diſcharge it yields be of a favourable kind; but care ſhould, nevertheleſs, be taken to keep the healing edges perfectly clean. A white ſcurf, or cruſt, uſually accumulates round theſe edges, which is formed of the coagulable lymph of the blood. This, if left to itſelf, will form layer upon layer, till a callous edge is produced, and immediately under it a hollow kind of ulcer.

To avoid theſe conſequences, we ſhould every day carefully, yet with as little force as poſſible, ſcrape off this white matter, either with a ſpatula, a probe, or ſome ſuch inſtrument; being cautious in ſo doing, not to injure the tender ſkin which we ſee advancing

over the granulations. Waſhing it alſo with a ſolution compoſed of one grain of nitrate of ſilver in two ounces of diſtilled water is an excellent method.

Another external remedy in ulcerations of the legs we learn from a late account communicated by Dr. Filter to Dr. Geſenius, who has inſerted it in his excellent "*Manual of Therapeutics*," 2d. edition, 8vo. Stendal, 1796, in German; and as this remarkable fact is as yet little known in this country, we ſhall here give a tranſlation of Dr. Filter's report, nearly in his own words:—"I have (ſays this excellent phyſician), in two caſes of inveterate ulcers of the legs, made uſe of the *Anguſtura bark*. The firſt caſe was that of a lady who had long paſſed the period of menſtruation, and for many years had been afflicted with arthritic pains. The ulcer, which had continued open for ſeveral months, and began to extend rapidly, was completely cured by means of frequent fomentation, with a decoction of this bark. In a ſimilar caſe of a woman whoſe menſtruation was ſuppreſſed, I directed to duſt the fetid ichorous ulcer on the lower part of the thigh with the powder of Anguſtura bark, which not only produced more favourable pus in the courſe of a few days, but likewiſe performed a complete cure within a few weeks, without having preſcribed, either in this, or in the preceding caſe, *any internal remedies*, which might have had a particular effect in contributing to the ſpeedy cure of the patients."

Of the topical application of *dry powders*, and other ſubſtances, to ulcers which have *no ſpecific character*, but exiſt from weakneſs, indolence, or long habit, an excellent account is given by Mr. Home in the Tranſactions of a ſociety inſtituted in London for the improvement of medical and chirurgical knowledge.

"The uſual mode of treating ulcers of this kind," ſays Mr. Home, "is by ſtimulating, or by ſedative applications; when neither of theſe are thought neceſſary, dry lint is commonly applied to the ſurface of the ſore, to abſorb the matter, and ſome unctuous covering is laid over it, to prevent evaporation, and more readily admit of the removal of the dreſſings.

"Stimulating medicines are commonly mixed up with ſome of the expreſſed oils, and applied in the form of an ointment; but thoſe applications that are intended to act as ſedatives, are uſually combined with water, and made uſe of in the form of fomentations and poultices.

"Both theſe modes of applying medicines to an ulcer, experience has proved to be improper as a general practice. Unctuous dreſſings are found not unfrequently to diſagree with the ſurrounding ſkin, and, when brought in contact with the ſurface of an ulcer, become extremely irritating. Watery dreſſings, from the weight which is neceſſary for their conſtant application, are in many inſtances both inconvenient and hurtful; and, when long

continued, give the granulations a diſpoſition to be luxuriant and flabby.

"From the knowledge of theſe facts, which are I believe ſufficiently eſtabliſhed, ſurgeons have, for ſome years paſt, applied their minds to ſtrike out ſome improvement; and various ſubſtances in the form of powder have been propoſed, as ſubſtitutes for the common dreſſings.

"In the courſe of theſe laſt fourteen years, I have had frequent opportunities of attending to caſes of this kind, and have made uſe of a variety of ſubſtances, in different forms, as external applications. I have not only tried thoſe powders recommended by others, but have uſed ſome which had not before been thought of. Of the latter kind, a few appear to me to deſerve particular attention; my experiments and obſervations upon which, I have thrown together in this paper.

"As the *application of powders to ulcers* in general is a practice not yet much known, it may not be improper firſt to mention the reſult of my experiments on ſuch ſubſtances as have not been found to anſwer, that others may not loſe time in uſeleſs trials.

"*Tartar emetic*, in the form of powder, has been recommended, and I have uſed it in a variety of inſtances; in ſome it produced no viſible effects, and in others ſuch as evidently were unfavourable; nor in any caſe could I effect a cure, by perſiſting in the uſe of it.

"*Chalk* has had its advocates, but experience does not authoriſe me to give my teſtimony in its favour; it may anſwer in ſuperficial ſores, where nothing in fact is neceſſary to be done. This powder, when firſt applied, does not ſeem to produce the ſmalleſt irritation; but if it be long continued, the ſore in general, although not always, becomes foul.

"*Plaſter-of-Paris* is an application I was led to make uſe of ſeveral years ago, from an idea that it would abſorb the matter of a ſuperficial ſore as faſt as it was ſecreted, and form a cruſt, which, ſimilar to a ſcab, would induce the parts underneath to ſkin over; experience, however, proves that this is not the caſe, and the edges of the ſore, in many inſtances, are much irritated by this application.

"*Lapis calaminaris*, in the form of powder, has had a character with ſeveral ſurgeons for having the power of diſpoſing ſuperficial ſores to ſkin over; I therefore thought it deſerving of a trial. I uſed it in a great many inſtances, and no one circumſtance has occurred from which I could conclude in favour of its efficacy.

"That each of theſe four ſubſtances has been found, in particular inſtances, to ſucceed, I am very ready to believe; but, as far as my own obſervations lead me, I am inclined to think that they are not to be ſet down as applications on which dependence can be placed in the cure of ulcers.

"The uſe of theſe mineral ſubſtances in powder having proved

unſucceſsful, I was led to conſider how far the vegetable medicines could be applied in that form with advantage; and I was encouraged in this enquiry from having, in many inſtances, experienced the good effects of the carrot and caſſada poultices, which are nothing more than the powder of theſe roots in a moiſt ſtate *.

"During the laſt war, I was eight months in the iſland of St. Lucia, in the Weſt Indies, where ulcers on the legs of the worſt kind were exceedingly numerous; and the application from which they appeared to derive the greateſt benefit, was the caſſada-root grated into a powder, and moiſtened with water. It did not at that time occur to me, that it might be uſed in a dry ſtate.

"As *rhubarb* has conſiderable powers in ſtimulating the villous internal ſurface of the ſtomach and inteſtines, which, in appearance, is not very diſſimilar to that of a granulating ſore, I made choice of this powder as an external application.

"I began my experiments by covering the ſurfaces of ſeveral ulcers with the powder of rhubarb, very thinly ſpread over them, and afterwards dreſſing them with a pledget of common ointment. Theſe applications were renewed once in twenty-four hours. Under this treatment the ſores mended for ſeveral days, and then ſeemed to be at a ſtand, although they retained a healing appearance. This circumſtance was not readily accounted for, but as the pledget was exceedingly greaſy, and came in contact with the edges, and many other parts of the ſore, it was attributed to that cauſe, and a piece of lint was therefore interpoſed between the powder and the unctuous covering, after which the granulations became diſpoſed to form ſkin, and the ſores were gradually healed.

"Encouraged by theſe trials, I made uſe of this powder under a variety of circumſtances, with a ſimilar reſult. In ſome caſes it appeared, after being continued ſome time, to loſe its effect upon the ulcer. But even in theſe inſtances, the applying it twice in the ſame day was ſufficient to reſtore the firſt effect. In other caſes the rhubarb ſeemed to be too violent an application, in ſome degree diſpoſing the granulations to ulcerate: this effect was however prevented, by adding to it the *powder of opium*, in the proportion of a drachm to an ounce. By theſe means the application of this medicine may be adapted to the degree of indolence or irritability in the ſore to which it is applied.

"Having aſcertained the effects of what is commonly called Indian rhubarb, I made comparative trials with that imported from Turkey, but could not diſcover any difference that appeared material. Rhubarb in the form of tincture did not by any means produce ſimilar effects; on the contrary, the ſores to which it was applied, when irritable in their nature, put on a foul appearance;

* The caſſada is the *ſatropha mannihot* of Linnæus.

when indolent they were leſs affected, but did not acquire the ſame healing diſpoſition that the powder uſually produced.

"After confining my experiments to rhubarb, and having this ſucceſs, I was naturally led to try the effects of other vegetable powders. It ſeemed neceſſary to determine whether this healing property was peculiar to rhubarb, or, if it be in other vegetable ſubſtances, in which of theſe it exiſted in moſt perfection.

"With this view, I ſelected the following powders, as proper ſubjects for my experiments, and ſhall ſtate, in as few words as poſſible, the reſult of my obſervations upon them.

"*Ipecacuanha* appeared to irritate the granulations to which it was applied, giving the ſore a foul appearance*.

"The *flour of muſtard*, applied by itſelf, not only irritated the granulations, but excoriated the ſurrounding ſkin; to prevent theſe effects, it was mixed with the farina of lintſeed meal in different proportions. Thus weakened I applied it to ſeveral ſores, but did not find its general effects ſufficiently favourable to induce me to continue this application.

"The *gentian* and *chamomile* were uſed ſeparately, in a variety of caſes. The ſores under this treatment went on tolerably well, and the granulations put on a florid and healing appearance; but the proceſs of forming new ſkin was extremely ſlow, when compared with the effects of rhubarb. Comparative trials of theſe powders with rhubarb on the ſame ſore, afforded ſufficient evidence of the inferiority of their powers in diſpoſing ulcers to heal.

"The powder of the *columba-root* appears, from its effects, to bear a greater reſemblance to the rhubarb than any of the other ſubſtances which were made trial of. In ſeveral caſes where the ſores had become ſtationary under the application of the rhubarb, changing it for the columba produced a diſpoſition to heal, which continued till the ſores got well. This certainly is in favour of the columba, but is no proof of its ſuperiority, ſince all medicines loſe their effects from being long continued; and, when that happens, ſimply leaving them off may produce a cure, or diſpoſe the parts to get well under applications which before had failed.

"My experience of the effects of this medicine being leſs extenſive than of thoſe of rhubarb, I am unwilling to ſay more reſpecting it; but in uſing columba, the granulations ſometimes riſe above the ſurface, a circumſtance which does not occur when the rhubarb is uſed.

"It will hardly be neceſſary to mention here the difficulties which muſt occur to every medical practitioner, in aſcertaining the effects of a medicine; the only ſatisfactory mode of doing which, is to compare a number of reſults, obtained under different circumſtances, deducing his concluſions from the aggregate.

* Equal parts of ipecacuanha and rhubarb make an uſeful mild eſcharotic for deſtroying warts.

"In determining the effects of local applications, the surgeon is often misled by some circumstances which are not, I believe, sufficiently attended to; these, therefore, I shall briefly mention.

"It should be observed, in the first place, that almost all sores appear for a time to receive benefit simply from a change in the dressing, although the new application be by no means better than the former. In the second, that all local applications lose their effects upon a sore, whatever they might be, after long continuance.

"The circumstances of the patient are also to be taken into the account, before we can well ascertain the effects of our treatment. A man who has been suffering all the distresses of poverty, when taken into an hospital, where he is kept quiet, and well taken care of, will mend under any treatment; and in many instances would get well without the assistance of medicine. In all ulcers, on the lower extremities particularly, rest alone is of the utmost benefit. To these and similar circumstances, attention must be strictly paid, with due allowance for their natural effects, in all experiments that are attempted on this subject.

"Having given a general view of the effects of rhubarb as an application to ulcers, and compared them with those of other vegetable and mineral powders; I shall add only a few observations upon the particular changes which most commonly occur in sores while under this treatment.

"In mentioning rhubarb as a dressing, it is not meant to bring it forward as one that will in every case succeed; but only to introduce it into practice, as a mode of treatment superior to some now in use: as one which will be found not unfrequently to give the granulations a healing disposition, and when they have arrived at the external surface, dispose them to form skin.

"In the course of the last twelve months I have used this dressing almost constantly in St. George's hospital, in a large infirmary, where ulcers in the legs are very numerous, and in private practice. From the different cases which have occurred in these situations, I have been led to make the following remarks upon the effects of this medicine.

"When the rhubarb is first applied, the sore is commonly more painful than it was before, and the whole surface becomes of an uniform red colour. In foul ulcers, where the matter is principally composed of coagulable lymph, adhering to the surface, a change is produced in the discharge; it becomes more like true pus, which separates from the surface, and exposes the granulations to our view.

"In sores where the granulations are large, spongy, and semi-transparent, under this treatment they become small, firm, very pointed at the surface, and of a florid colour; they are also sensible to the touch, making the sore extremely tender.

"The granulations, as soon as they have risen to the level of the

ſkin, ſeem to have a ſtop put to their growth; and thoſe that are next to the ſurrounding cutis loſe their irregular pointed appearance, become ſmooth, ſhining, and of a more florid colour than the reſt of the ſore. In this way a margin is formed, about one-eighth of an inch broad, which is afterwards covered by a cuticle, contracting the ſize of the ſore; and this proceſs goes on till the whole is ſkinned over.

"This circumſtance of the granulations becoming ſtationary when arrived at the level of the ſkin, is ſo general an effect, that in an hundred caſes, many of theſe ſores nearly equal to ſix inches ſquare, no one inſtance to the contrary has occurred.

"When the ſore is beginning to heal, or has in part ſkinned over, the powder adheres firmly to the edges, and ſometimes to the ſurface of the granulations, forming a cruſt over theſe parts. This ſhould be carefully removed at each dreſſing, as it confines the matter, which is often productive of miſchief, and always retards the progreſs of the cure."

From theſe facts, which Mr. Home alleges have been aſcertained by experiments too frequently repeated to admit of much fallacy, he ventures to recommend rhubarb as an application which will be found uſeful in the treatment of ulcers; leaving it however to a further and more complete experience to determine the exact place it is to hold among the applications more generally uſed by ſurgeons.

When an ulcer makes a favourable ſort of progreſs, it is by no means neceſſary, or proper, to uſe any topic poſſeſſing active properties. Where healthy granulations ſpontaneouſly appear, and fill up the cavity of the ulcer, no ſtimulus can be wanting, or would be proper; and where, after that is accompliſhed, the ſkin is ſeen to advance gradually over the ſurface, no application can be neceſſary but a layer of dry lint, ſhaped nicely to the dimenſions of the granulating ſurface to abſorb the diſcharge, and an outer dreſſing of ſome ſimple ointment, to prevent its edges from adhering when a renewal of the dreſſings becomes neceſſary.

Some few years ago, Mr. FRAHM, a ſurgeon, in the Daniſh dominions, publiſhed a treatiſe in which he recommended the cure of old ulcers of the legs, by exciting an artificial inflammation round the parts affected, by means of turpentine or other ſtimulating plaſters, keeping thoſe parts properly ſecured by bandages, and the ulcers regularly dreſſed by ſimple ointments, till nature, with the aſſiſtance of the neceſſary internal remedies, according to the circumſtances of the caſe, recovers ſufficient tone and ſtrength to heal the enlarged ulcers. Another method ſtill more ingenious has been lately ſuggeſted by Mr. BAYNTON of Briſtol, in his "*Deſcriptive Account of a new Method of treating old Ulcers of the Legs*," of which we ſhall ſpeak hereafter.

It may not be amiſs to conſider, in this place, what are the cir-

cumſtances which ought to guide us in determining at what particular periods the dreſſing of an ulcer requires to be repeated. The cuſtoms of ſurgery have, in ſome degree, decided this point in favour of the repetition of freſh dreſſings *once* a-day, and in ſome caſes *twice*; but ſcarcely ever has it been the practice to renew them oftener. The greater or leſs frequency of the ſurgeon's viſits have, indeed, had ſome influence in this reſpect; and the patient not uncommonly conſents to ſuffer ſome hours of inconvenience rather than take off his dreſſings at any other moment. That this rule has both its advantages and diſadvantages is extremely obvious; but let us enquire how far a general rule may be put in practice, with regard to the renewal of our applications to an ulcer.

There is ſcarcely any inſtance, in which an ulcer, however healthily diſpoſed, will not after long remaining undreſſed become more or leſs uneaſy. The matter diſcharged, though of a quality the moſt favourable that can be wiſhed, will acquire irritating qualities barely from the circumſtances of its being pent up. The natural heat of the part diſpoſes it to putrefaction, or ſome ſpontaneous chemical change, by which it becomes capable of acting on the ulcer that produced it, greatly, perhaps, to its injury. In ſuch a caſe, it is likely that every ill conſequence would be obviated by renewing our applications at the cuſtomary periods; but where an ulcer is ſo large as to yield a good deal of pus, or where, whether large or ſmall, its diſcharges are thin, offenſive, and irritating, the inconvenience of retaining the dreſſings for too many hours together cannot fail of being conſiderable.

Perhaps there is no ſurer guide to direct us in theſe reſpects, than that obvious one, of the patient's own feelings; at leaſt, it is certain, that the operations of nature are not to be calculated by the movements of the clock. An ulcer healthily diſpoſed not only forbids our interference, but univerſally reſents it when prematurely exerciſed. The patient's feelings cannot in that caſe be called in queſtion, as a juſt indication of the time when our applications ſhould be renewed. An uneaſy diſpoſition in the part, tells us what we ſhould do, and till this happens, it is plain we ought to do nothing.

This queſtion, however, applies to every deſcription of ulcer; but there may be ſome, where the pain is of neceſſity brought on by the remedies applied, or is an exiſting, and perhaps unremitting, ſymptom, connected with the ulcer itſelf. Under ſuch circumſtances, we are warranted in forming a judgment for ourſelves as to the proper periods when freſh dreſſings ſhould be applied. If the patient has an interval of eaſe, it ſhould, by no means, be interrupted; for there is no aſſiſtance which *we* can afford that will compenſate for our officiouſneſs at an improper moment.

For the moſt part, where there is much pain and irritation, there is a proportionate *quantity* of diſcharge, and where that is the caſe, the nature of our dreſſings ſhould either be ſuch as to abſorb the fluids as faſt as they are formed, or the renewal of freſh dreſſings muſt be more frequent.

It is neceſſary, in fact, that the dreſſing for an ulcer, particularly a large one, ſhould be *pervious* to the matter diſcharged from it. For this reaſon, there is no outer dreſſing that can be uſed more proper than tow; although, in the practice of ſome ſurgeons, it may appear, and certainly is, more coarſe and inelegant than lint. It has, nevertheleſs, the advantage of letting out the diſcharge more readily than the latter, and of ſuffering it to paſs into the cloths which ſurround the limb, which may be eaſily renewed when freſh dreſſing is not adviſable.

Every ſurgeon muſt have had occaſion to remark the importance of giving the diſcharge from an ulcer a free paſſage. Nothing, indeed, is more common, than to ſee an ulcer converted into a ſort of iſſue, by the practice of confining the diſcharge; which is commonly done, firſt, by applying an outward dreſſing which is impervious, and ſecondly, by binding this ſo firmly on, that the matter can have no outlet, but muſt act upon the ſore in the ſame way as a pea does in an iſſue; with this difference, indeed, that on every renewal of the dreſſing, the ſore muſt become larger and larger, whilſt, in the other caſe, it is confined to certain dimenſions. Outer dreſſings of linen rag, ſpread with any tenacious ſalve or ointment, are particularly exceptionable in this view; the matter, indeed, which cannot find its way through the pores of the linen, attempts to force itſelf between the plaſter and the ſkin, but when a bandage is employed at the ſame time, its eſcape, even by this means, is prevented; and thoſe conſequences take place of which I have juſt now made mention.

The foregoing circumſtances evince that the *manner how* is not leſs important than the *time when* our medicinal remedies ſhould be applied to ulcers; and what we ſhall now mention, will be a further confirmation of this. The general treatment of theſe is, perhaps, in nothing more defective than in reſpect to the ſmall degree of care and attention employed in adjuſting the different applications nicely, and with a mechanical ſort of exactneſs, to the diſeaſed part, without which the beſt-choſen remedies will be found to anſwer no great purpoſe. In fact, there may reſult from an error in this reſpect, effects poſitively injurious, ſince it commonly happens, that different remedies are required to different parts of the ſame ulcer, and if theſe are not nicely accommodated to the ſituations for which they are deſtined, very eſſential miſchief may be produced.

But if it be of conſequence to avoid a ſlovenly treatment in theſe reſpects, ſtill more is it of importance to attend minutely to the mode of applying the bandage, which, though an admirable remedy

in judicious and careful hands, is often the cauſe of conſiderable miſchief to ulcers.

The preſſure applied to the leg ſhould be extended over the whole of its ſurface, and ſhould likewiſe be *equable* in every part. If a bandage be ſo applied that it ſhall ſtrongly bind the limb in one part, and not in another, the conſequence muſt be, that the blood will be unequally diſtributed over the ſurface; the circulation being impeded in ſome parts, whilſt in others, it is too much accelerated. Thus, if any ſingle turn of the bandage be drawn tight over the ulcer, the conſequence will be pain and irritation; and if the upper turns be all of them tight, whilſt the lower ones are ſlack, the blood will be arreſted in the veins as in the uſe of a ligature in bleeding.

It is to the want of accuracy in applying the neceſſary remedies to ulcers, together with the inſufficient, or perhaps injurious, uſe of the bandage, that we are to attribute the very little good that is done by furniſhing the patient with *remedies to uſe himſelf.* For once that he dreſſes the part properly, he fails to do it ten times; and the reſult is, that the cure does not proceed; nay, it is well if the progreſs made be not that of *ulceration.* To theſe impediments we may likewiſe add, the repeated, and ſometimes rapid, changes which take place in different parts of the ſame ulcer. Theſe neceſſarily call for a correſponding change in the applications to be employed, but of courſe are not attended to by the patient, who, having nothing to guide him but the general inſtructions given him by the ſurgeon, goes on from day to day in the uſe of one particular plan, which, though perfectly ſuitable at firſt, has now become uſeleſs at leaſt, if not detrimental.

As the application of dreſſings, and of the bandage, as far as the *manner* of doing them is concerned, uſually falls under the management of gentlemen ſcarcely yet initiated in chirurgical buſineſs, it is too common to ſee them haſtily, and of courſe inadequately, performed; and it is particularly unfortunate, that the hurrying way in which ulcers are dreſſed in the largeſt hoſpitals, affords the ſtudent ſo few opportunities of convincing himſelf how eſſential to the cure of an ulcer is a *deliberate, neat, and ſyſtematic way of applying the neceſſary remedies.*

Having thus ſpoken generally of topical applications for ulcers, we ſhall now ſpeak of their ſymptoms.

Sect. VI. *Of the Symptoms of Ulcers.*

As it is by the ſymptoms that we are guided in the management of every diſeaſe, it is a matter of no ſmall importance to conſider them fully in the preſent caſe.

1. In treating of the ſymptoms of ulcers, we ſhall begin with

pain; as that is, in many cases, one of the most troublesome, both to the patient and the surgeon. Some ulcers are in a state of entire indolence (and are not attended with any pain), whilst others are sensible in the highest degree. It is common to attribute this to the greater or less degree of inflammation affecting the ulcer; but there is reason to believe, that this is a mistaken notion, since it is by no means an unusual thing to find the pain of an ulcer relieved by those means which would augment inflammation, as by the use of stimulants, or the application of a very tight bandage. It seems, therefore, rather to arise, in many cases, from a peculiar flabbiness, want of tone, and consequent increase of irritability in the part.

In other instances, although there appears no material degree of inflammation, we find it extremely difficult to overcome this symptom in an ulcer; and, as there exist no particular appearances to direct us to the cause, we are under the necessity of trying different remedies one after the other, till we hit on that, which, in the language of the patient, *agrees with* the sore.

In the treatment of this symptom in ulcers, besides the usual warm and moist applications, we should seek to afford relief by the topical use of opium. We should mingle it as well in our fomentations as in the dressings applied directly to the ulcer. Sometimes the tincture of opium, brushed over the sore with a camel's hair pencil, is of signal service; notwithstanding its first effect is to stimulate and give violent pain. The addition of a very small proportion of camphor has, likewise, in many instances, contributed to the object in view; but, in the use of this remedy, it is always to be observed, that its acting as a sedative, or a stimulant (in both of which characters its powers are very considerable), depends entirely on the proportions being nicely adapted to the sensibility of the part. The *cataplasma natri vitriolati* of the Pharm. Chirurg. a remedy employed for another purpose, by Dr. Kirkland, will sometimes answer this intention, as will sometimes sprinkling the part with a powder of the dried leaves of hemlock, or applying that narcotic vegetable in the different forms of a bath, fomentation, or poultice.

Sometimes, on the other hand, cold applications to the ulcer will succeed best, as the solutions of acetated lead, muriated quicksilver, vitriolated zinc, &c. Brushing the sore with a weak solution of nitrated silver, will often remove the pain, by exciting a new action in the part; as will also, on the same principle, a solution of arsenic, in the proportion of one grain to a quart of water, the liquor being filtered before its application is attempted. The solution last mentioned, may also, with great propriety, be applied in the form of a cataplasm. Dressing the wound with ointments, in which the stimulating gums or quicksilver enter as ingredients, has also been attended with advantage: but it would be an endless attempt to enumerate the various remedies, which, on the principle

of exciting a *new action* in an ulcer of the painful deſcription (a principle, on which, in the great r number of caſes, relief can alone be afforded), have been in uſe among practitioners, and employed according to exiſting circumſtances.

2. Another ſymptom ſometimes attending ulcers is a *ſinus*, from whence, ſome ſurgeons denominate an ulcer in which this appearance takes place, a *ſinuous ulcer*. There may exiſt one or more of theſe ſinuſes in the ſame ulcer, and they may be diſcovered by preſſing the adjacent parts, which will occaſion the matter to flow out, ſo that their extent may afterwards be examined by the introduction of a probe.

We have already obſerved, that theſe ſinuſes are ſometimes occaſioned by the accumulation of coagulating lymph on the edges of a wound, and that they may be prevented from taking place, by daily ſcraping off the white matter with the edge of a probe, or any other dull inſtrument. When the ſinus has exiſted long, or is completely eſtabliſhed, the cure muſt depend on attending to the ſame rules as are uſually obſerved in treating thoſe ſinuſes which accompany an abſceſs. A compreſs may be applied if the ſinus be ſuch as to admit of being acted upon by ſuch a remedy; otherwiſe, inciſion, a ſeton paſſed through, or a counter-opening, may be attempted; and one or other of theſe means will, in general, prove ſucceſsful.

3. If, by injudicious management, or a long continuance of the complaint, the ſinus ſhould have acquired a degree of hardneſs, it is then degenerated into what we call a *fiſtula*, and the ulcer then is termed a *fiſtulous ulcer*. In this caſe, the moſt efficacious treatment is, to lay it completely open by an inciſion; but, if we are rather induced to try the effect of compreſſion, the calloſity muſt firſt be got the better of, and this is only to be accompliſhed by injecting ſtimulating liquids, as tincture of cantharides diluted with water, or a pretty ſtrong ſolution of muriated quickſilver, &c. Or it may be attempted by introducing a doſſil of lint, firſt greaſed with ſome ſimple unguent, and afterwards rolled in red nitrated quickſilver: or, if a ſeton be uſed in this caſe, that alſo muſt be covered with the ſame, or ſome other corroſive preparation.

The effect of theſe applications is to deſtroy the internal ſurface of the fiſtula, or, at leaſt, to excite ſuch a degree of inflammation and ſuppuration in it, as will increaſe the diſcharge, overcome the hardneſs, and diſpoſe the ſurface to throw out healthy granulations of fleſh ſufficient to fill up, and finally conſolidate the cavity.

4. Another ſymptom, which it is neceſſary to notice as attendant upon ulcers, is the *calloſity of the edges*, from which circumſtance, ſome writers have given theſe ulcers the name of *callous ulcers*. To guard againſt this ſymptom, it is ſtill more important, than in the laſt inſtance, to remove the coagulable lymph which collects on the edges. But, notwithſtanding every effort of this ſort, hard edges

will ſometimes take place in ulcers; and when they do, they oppoſe a moſt obſtinate reſiſtance to the progreſs of the cure.

In general, a very effectual way of ſoftening them, is, to rub them with unguentum hydrargyri, prepared of the ſtrength propoſed by the London College; or, what may anſwer ſtill better, is the applying it by way of a pledget, over the dreſſings covering the ſore, taking care that it is made to come in cloſe contact with the edges. M. le Dran ſtrenuouſly adviſes ſcarifications to be made all round the ulcer, at certain diſtances, and penetrating completely through their ſubſtance. Theſe, he adviſes to be made every fourth day, till the wound is brought into a proper ſtate; and he aſſerts, that in the courſe of his practice this method never failed him. But, there are few patients who are willing to ſubmit to this method; and, indeed, there is reaſon to believe, that the deſtruction of the callous edges, by means of ſome cauſtic application repeatedly applied, will anſwer equally well. The parts may be well rubbed with nitrated ſilver every day; or, if that prove inſufficient, kali purum may be cautiouſly applied; or that old-faſhioned, yet uſeful cauſtic, butyrum antimonii, the liquid form of which renders its application peculiarly commodious in ſuch caſes. Some one of theſe will ſcarcely fail to counteract this troubleſome ſymptom effectually; whilſt proper remedies continue to be applied to the ulcer itſelf, to diſpoſe it to granulate.

We muſt not quit this ſubject, however, without mentioning another expedient which has been uſed to reduce the callous edges of ulcers. This method is, by applying, in ſuch a way as to *preſs on the edges only*, a piece of ſheet lead, ſhaped in exact conformity to the figure of the wound, and ſecured by a bandage. A conſiderable degree of calloſity in the parts may certainly be overcome by this ſimple method, which, in ſlight caſes, at leaſt, deſerves to be had recourſe to in preference to more violent expedients.

5. It has been obſerved by moſt writers, that that kind of ulcer which is diſtinguiſhed by callous edges, is alſo attended with a varicoſe ſtate of the veins of the whole leg. Theſe varices not only impede the cure, but are likewiſe apt to occaſion a return of the ulcer, and they ſometimes burſt, and produce a very troubleſome, and even dangerous, hemorrhage. The only method of treating them is, to apply a conſtant and uniform external preſſure, either by bandage or a laced ſtocking, over the whole leg. When they happen to burſt, the hemorrhage may be reſtrained, by applying powerful ſtyptics, as oil of turpentine, &c. to the opening; or it may be neceſſary, where the bleeding happens in a patient of a very debilitated conſtitution, to cut down to the vein, and ſecure it by a ligature, as in the caſe of an artery.

As the ancient ſurgeons obſerved that ulcers of the callous deſcription uſually occurred in thoſe legs in which varices were moſt prevalent, they gave thoſe ulcers the name of *varicoſe*; and in this

they have been imitated by many of the moderns, certainly with ſome degree of propriety, ſince ſuch ulcers cannot but have their origin in a diſeaſed ſtate of the veins of the part, however juſtly they may afterwards deſerve the appellation of *callous*.

6. The next ſymptom we ſhall ſpeak of, as attending an ulcer, is *caries*. From this being the ſtate of the bone lying immediately beneath an ulcer, authors have diſtinguiſhed the latter by the name of the *carious* ulcer. It is ſeldom, however, that the ulcer, in ſuch a caſe, is to be conſidered in any other light than as a ſecondary affection; and a proof of this is, that its appearance is not, in general, indicative of a want of vigour, but rather that of too great luxuriancy and redundance of granulation; nor does it, in general, fail to get well, whenever the exfoliation of the diſeaſed bone is completely effected.

Many ſurgeons, however, incline to an opinion, that the ulcer, in this caſe, is the cauſe, and not the conſequence of the caries, and that, happening to take place on a part where little or no muſcular ſubſtance intervenes between the bone and the ſkin, as on the ſhin bone, the acrid matter finds its way to the perioſteum, and thence the caries is eſtabliſhed. From every enquiry, however, that we have been able to make with regard to the origin of this complaint, we have found reaſon to think differently. The cauſe of this kind of ulcer has, in moſt caſes, proved to be ſome violence done to the part; which, whilſt it produced the ulcer, laid alſo the foundation of the caries. In other inſtances, the bone has evidently been the firſt affected; and the ulcer produced, has reſulted from the formation of matter upon or near to its ſurface. This, indeed, has not been uniformly the caſe: but ſufficiently ſo to juſtify the general ſuppoſition we have adopted, that the ulcer denominated carious is the effect of a primary affection of the bone, and is kept up by the irritating proceſs going forward beneath the ſurface.

But it is of much leſs conſequence to be able to decide on this point, than to poſſeſs ourſelves of the means of diſtinguiſhing, when this ſpecies of ulcer is offered to our examination, whether the bone beneath be really carious or not; for, on this circumſtance depends the plan of treatment which it may be prudent to adopt, as well as our proſpect of finally ſucceeding in the cure of the ulcer.

On the firſt view of an ulcer covering a carious bone we are generally ſtruck with the prominent appearance, not only of the ulcer itſelf, but of the whole ſurrounding parts, which are, as it were, lifted up by ſome ſolid ſubſtance beneath; though, at the ſame time, we perceive deepneſſes, and granular irregularities in ſome parts of the ulcer itſelf. Theſe hollow parts are commonly ſeen filled with the diſcharge, which is of a blackiſh purulent appearance, and of a very putrid ſmell. Between theſe ſpaces it is ſometimes practicable to paſs a probe, the examination with which is often the moſt ſatisfactory and deciſive teſt of the exiſtence of a

caries of the bone, that we can desire. The disease, however, cannot always be ascertained by this means; and we are left to judge, by the concomitant circumstances, whether this really be the fact or not.

Among the appearances which characterise this species of ulcer, not the least equivocal is the peculiarity of colour and loose texture of the new-formed parts. The granulations, instead of wearing a florid and healthy appearance, are dark, and approaching to a liver colour; and the healthy edges, if any can be distinguished, have a remarkable blueness.

With regard to the *treatment of the carious ulcer*, it must evidently depend on the treatment of the caries; and that is a subject not immediately under our notice at present. There is no doubt but, in many instances, the healing of the ulcer has, without this, been accomplished, though the cure has not afterwards proved very lasting.

The skin may, by the use of common remedies, rest, &c. be prevailed on to close the wound; but the irritation arising from the deeper seated mischief will not long suffer it to remain so; nor indeed is it of much advantage to the patient that it should, since the inconvenience produced by the carious bone is not much more considerable with than without the ulcer.

7. We shall now take notice of a symptom attendant on ulcers, which has not been, in general, noticed by writers on this subject. It is peculiar indeed to hospitals, few if any instances occurring of it, as far as we have been able to learn, in the private practice of gentlemen of the profession. It usually happens in those simple ulcers that are the consequence of large operations. When the healing of the sore is nearly completed, the patient, perhaps, will be suddenly attacked with violent pain in the part. This is succeeded by a phagedænic slough, beginning on the sore, and gradually increasing, till the whole wound, however great its original extent may have been, is again laid open; nay, it is not uncommon for the sloughing to extend to the sound parts, where no wound existed before.

When the first slough has separated it is succeeded by many others, and accompanied with a most abominably fetid discharge; and this interruption to the cure will sometimes occur two or three different times in the same subject; or perhaps the cure cannot be accomplished without removing the patient into a purer air.

There can be no doubt, from this last circumstance, but that this symptom is chiefly, if not entirely, owing to the local poison arising from hospital effluvia. It must nevertheless be considered, that hospitals, those of the metropolis at least, are the receptacles of half-famished and debilitated persons, in whom the disposition to gangrene cannot but be much greater than in persons who enjoy a competent share of good diet, or indulge in the luxuries of the table. It may

be alledged indeed, that this ſymptom is exceedingly different from gangrene, yet it cannot be denied, that it is putrid in its nature, attended by a low pulſe, and relieved by ſtimulants, opium, and the bark; all remedies peculiarly demanded where a part exhibits a diſpoſition to gangrene.

8. The laſt ſymptom on which it is neceſſary we ſhould remark, is one that is very frequently obſerved in old ſore legs. We find the limb in many of theſe caſes much ſwelled, and filled with indurated tumors or lumps in one or more parts, which will not always be reſolved by the diſcharge from the ulcer. This ſymptom is in ſome inſtances marked with a peculiar degree of obſtinacy, and occurs now and then alſo in the patient's other leg where no ulcer exiſts.

Sometimes, by way of reducing theſe hardneſſes, the application of a ſtrong volatile ſoapy liniment is of ſervice; as is ſometimes electricity, and the inunction of quickſilver ointment well impregnated with camphor. Incloſing the whole leg (where no ulcer forbids) in a mercurial plaiſter is a good remedy, ſince it acts not only by exciting the abſorbent veſſels, but alſo by confining the perſpiration. Upon the latter principle, the application of oil-ſkin has been recommended by Mr. Underwood, and no doubt deſerves a trial. But, notwithſtandiug the united aſſiſtance of theſe remedies, it is not uncommon to meet with caſes in which this ſymptom cannot be got the better of, but the parts will remain in a ſtate that continually threatens farther injury, and excites uneaſy apprehenſions in the mind of the patient.

Hitherto we have conſidered an ulcer only as a *topical* diſeaſe, independent of any *vice in the ſyſtem*; we ſhall now ſpeak of thoſe ulcers in which *the conſtitution evidently participates*. In this we ſhall continue to avail ourſelves of Mr. Nayler's excellent Treatiſe on Ulcers.

The different kinds of virus which occaſionally prevail in the ſyſtem, and which are capable of producing ulcers of a ſpecific character, are five; to wit, the *ſcorbutic*, the *venereal*, the *ſcrofulous*, the *phagedænic*, and, laſtly, the *cancerous*. Of theſe we ſhall ſpeak in their order, and ſomewhat more in detail of the three laſt, as forming the moſt intereſting part of our ſubject.

SECT. VII. *Of the* SCORBUTIC ULCER.

ALTHOUGH it ſcarcely can be expected to happen, that ſo high a degree of ſcurvy can take place in perſons reſiding on land as occurs in thoſe who engage in long voyages, we nevertheleſs meet with many ulcers, which evidently bear the ſcorbutic character, evincing, if not a confirmed ſcurvy in the habit, at leaſt a very ſtrong tendency to that complaint.

This kind of ulcer may be very readily diſtinguiſhed from others of a different deſcription by theſe peculiar external ſigns, as well as by the general ſcorbutic ſymptoms, which, on enquiry, are generally found to affect the patient. Such are, a particular languid ſtate of the circulation of the blood on the ſurface of the body, an offenſive breath, ſoft, ſpongy, and bleeding gums, high coloured and irritating urine, &c.

The ulcer itſelf is very apt to bleed on being ſlightly touched; its colour is browniſh; its ſurface of a looſe unconnected texture, frequently ſhooting out fungous granulations, which alſo bleed on the gentleſt force that can be applied to them. The ſkin round the ulcer is of a livid, purple, or black hue; and if there be any ſpots, as there frequently are, theſe are all of the ſame complexion. The diſcharge is uſually thin and ſanious, and runs from the part in conſiderable quantity almoſt immediately after the ulcer is dreſt.

It may be objected to by ſome, perhaps, that we have conſidered the ſcorbutic ulcer as one of thoſe which ariſe from a particular kind of *virus*. It is pretty generally acknowledged, however, that the ſcurvy is a diſeaſe of the fluids, and depends on the exiſtence of ſome kind of *morbid matter*, affecting the blood's texture and *purity*; and if ſo, it is a ſuppoſition that does no great violence to probability, that theſe morbid or virulent particles lay the foundation of the ſcorbutic ulcer.

The *ſcorbutic ulcer* is perhaps the only one in which the article of diet is a matter of deciſive importance. The cure of the ſcurvy is well known to depend chiefly, if not entirely, on the uſe of proper vegetable aliment; at leaſt, this is the caſe after long ſea voyages; and though a ſcurvy contracted on ſhore may demand a regimen ſomewhat leſs ſtrict in this particular than one contracted by the uſe of ſalt proviſions at ſea; yet it is, nevertheleſs, a point very material to be attended to; for thoſe means which are powerful in correcting the ſcorbutic taint in the habit, muſt, of courſe, be important in the treatment of the ulcer; and the more eſpecially, as it cannot be cured whilſt that taint remains. A milk and vegetable diet is, therefore, that from which the beſt effects are to be expected; not, indeed, to the entire excluſion of animal food, but this ſhould be of eaſy digeſtion, great nouriſhment, and neither ſalted nor highly ſeaſoned. Salt, indeed, it has been thought abſolutely neceſſary to interdict the uſe of, as having a principal ſhare in the production of ſea ſcurvy; not, however, that this is a point by any means to be admitted as indiſputable, for we are rather inclined to attribute more to the *change* which fleſh meat undergoes by *being ſalted*, than to the operation of ſalt itſelf on the human body. The uſe of fermented, or even of *fermenting* liquors, is alſo to be adopted, in preference to drinks of any other deſcription, on account of the fixed air with which they abound.

In the topical applications to this ſort of ulcer, every kind of unctuous, or greaſy ſubſtance, is to be avoided. A poultice, prepared with rye meal, and an infuſion of malt meal, with the addition of a ſpoonful of yeaſt, is an excellent application; a conſiderable quantity of fixed air being extricated, and coming in contact with the ulcer in a ſhort time after its application. A mixture of bark and myrrh, in fine powder, ſprinkled or duſted over the ſurface, is alſo very beneficial. Poultices of carrots, or of turnips, are likewiſe good; and likewiſe the topic recommended by Dr. Lind, conſiſting of mel æruginis and mel roſæ, with a ſmall quantity of vitriolic acid.

With regard to *internal medicines*, in the cure of this ulcer, it may be proper to remark, that it has been cuſtomary with practitioners to adminiſter the moſt powerful remedies of the *tonic* claſs, ſuch, for inſtance, as the bark, vitriolated iron, vitriolated zinc, &c.: but as theſe were employed under a ſuppoſition which is not admiſſible, namely, that the ſcurvy is a diſeaſe of the *ſolids*, it would be inconſiſtent to dwell long upon this ſubject. In fact, we are in a great meaſure ignorant whether any internal medicines are of ſervice in the ſcurvy: but though it really is the caſe, that we know not what we ought to preſcribe, it is at leaſt in our power to determine what we ought to interdict; and on this point we ſhall now ſay a few words.

Among the remedies, employed by thoſe who are not in the habit of enquiring into the diſtinctions by which the different ſpecies of ulcers are marked, is quickſilver. It is exceedingly common with ſuch inconſiderate practitioners to give this powerful medicine, in one form or other, in almoſt every caſe of ulcer of long ſtanding; and, among the reſt, in the ſcorbutic ulcer. Repeated experience, however, has demonſtrated, that the ſcurvy, and every diſeaſe, whether local or general, in which it partakes, is extremely liable to be increaſed, and rendered worſe by that mineral. This fact has been chiefly ſhewn in thoſe inſtances, where, in a ſcorbutic ſubject, the venereal diſeaſe has demanded a mercurial courſe, the event of which has frequently been of the utmoſt injury in reſpect to the former; at leaſt, it has been ſufficiently deciſive of the dangerous tendency of mercury in the diſeaſe we are now conſidering, and conſequently, of any local complaint that may have originated in the prevalence of that diſpoſition in the ſyſtem.

The uſe of a bandage in this kind of ulcer (though without a ſuitable diet, &c. no leſs inſufficient to the cure than the other topics of which we have been ſpeaking), is, nevertheleſs, a material aſſiſtance where the diſpoſition to health has once begun to manifeſt itſelf. It has, at leaſt, the ſalutary effect of reſtraining thoſe looſe granulations of fleſh which are, in all inſtances, ſo redundant; and by ſupporting the weak and tender veſſels of the part, is a means of

preventing that almoſt continual waſte of blood, which would occur from every ſlight friction to which the part would be expoſed if not ſo defended.

Sect. VIII. *Of the* Venereal Ulcer.

Although the ſymptoms of the venereal diſeaſe, when they exiſt independent of any other affection, are ſo ſtrongly marked, that it is hardly poſſible for a ſurgeon, of any experience, to miſtake them, yet we very well know, when the caſe is otherwiſe, into what a variety of difficulties we are apt to be led, and how impoſſible it is, in many inſtances, to ſay deciſively, whether the diſeaſe we are called upon to conſider be a *venereal* one or not.

This incertitude, which attaches to ſo many of the ſymptoms of lues venerea, is in none more liable to be exemplified than in the venereal ulcer; which, though exhibiting, in ſome inſtances, a very marked and indiſputable character, is, in others, extremely equivocal.

In this ſpecies of ulcer, we very often obſerve ſome one of the characteriſtic ſigns exiſting along with thoſe that are evidently not venereal; and we are left in doubt whether we ought, or ought not, to reſort to a mercurial courſe.

Where theſe equivocal appearances occur, it is of ſome conſequence, beſides judging of the ſtate of the ſore, to queſtion the patient as to any other ſymptom of a venereal nature that may then exiſt, or that may have exiſted at any time previous to the appearance of the ulcer. We ſhould examine whether a venereal infection had been received; whether its nature was really that of *ſyphilis*, or only gonorrhæal; whether the cure had been attempted by carrying the uſe of mercury to a ſufficient extent; and, laſtly, whether, after what was ſuppoſed a perfect cure, any ſuſpicious ſymptom had occurred; ſuch as a ſore throat, eruptions on the ſkin, night pains, or nodes on the ſhin-bones.

If it can be clearly eſtabliſhed, that the patient has been affected with lues; or if there be room to ſuſpect that the means uſed to eradicate it have been inſufficient; we may venture to conclude, even where the ſigns of venereal ulceration are imperfect, and accompanied with appearances that are common to other ulcers, that the diſeaſe cannot be got the better of without the introduction of mercury into the ſyſtem. It is not, however, till after a fair trial given to the common remedies, that ſuch a plan ought to be purſued; and the more eſpecially as this equivocal deſcription of ulcer is liable to take on a ſtill more inveterate character in conſequence of the action of mercury, and to become phagedænic. This is particularly liable to happen in open buboes; as will be obſerved in another place.

There will exist, however, in every ulcer of a venereal nature, some one or more of the following signs. The true venereal sore is the most irregular of all ulcers; it seldom spreads out into one large sore, but usually appears in a number of small distinct ulcerations, as chancres do upon the penis. A bar or division of whole skin frequently runs across, and divides, what would otherwise be a continued ulcer, into two or more. This is perhaps the most distinguishing mark by which we may know a venereal from any other kind of ulcer, though it has scarcely been noticed by writers on this subject. Another mark, which occurs not only in the true venereal ulcer, but often assists us to decide in those of the doubtful kind, is the appearance of spots of a copper colour around the sore. These spots indeed do not always appear, but when they do, they corroborate very strongly any conjectures that may have been raised respecting the syphilitic nature of the ulcer.

Where there can be no doubt of the specific nature of the ulcer, the use of quick-silver in any mode that can be brought to affect the salivary glands, will, of itself, go a great way towards effecting a cure*. Not that local applications of a mercurial and corrosive kind should be neglected, for they are very material. Sprinkling the sore from time to time with red nitrated quicksilver, or dressing it with any stimulating ointment in which a portion of that remedy is incorporated; applying verdigrease in the same manner; or, what is, perhaps, more effectual than any other method, dressing the sore with lint dipped into a solution of muriated quicksilver; are steps very proper to be pursued. In a great many cases, the ointment of nitrated quicksilver, either alone, or weakened with hog's lard, will be found to answer; and it is sometimes of use to brush particular parts of the sore, that appear foul and sloughy, with a solution of nitrated silver in distilled water.

In those cases where the specific character in the ulcer is not yet got the better of, it is fruitless to endeavour, by bandage or any remedy not immediately placed in contact with the sore, to assist its cure. But, when the ulcer is brought to a simple state by the adequate use of internal medicines, we should then observe every precaution laid down for the treatment of common ulcers.

Sect. IX. *Of the* Scrofulous Ulcer.

The scrofulous ulcer is a disease not less manifestly depending on a particular state of the constitution than any of the foregoing; al-

* *Hydrargyrus cum Creta*, in the dose of five or ten grains twice a day, is an exceedingly good remedy for venereal *ulcers*, notwithstanding the opinion entertained by some, that it is inert. The *Hydrargyrus Muriatus*, in small and long-continued doses, is also a valuable medicine: but, in every *desperate* venereal case, mercurial *friction* should be had recourse to.

though it is not by any means to be conceived that it is generated by a ſpecific virus.

When this ſort of ulcer attacks a part, we are led to diſtinguiſh it from others of a different nature by conſidering the general habit of the patient, which will uſually ſhew ſome ſigns of ſcrofula. Thus the countenance will be pale, the fibre univerſally lax, the upper lip thick, the pupils of the eyes greatly dilated, or the borders of the eye-lids will appear ſore and red. The glands of the neck and under the chin may alſo be found hardened and enlarged; ſome one being much larger than the adjoining glands. This, indeed, is not uncommonly the only ſeat of the diſeaſe, the gland having ſuppurated, and afterwards become an ulcer.

When a ſcrofulous ulcer happens on the extremities, it uſually appears on the metacarpal or metatarſal bones, or on the joints of the ancle or wriſt, on which a conſiderable thickening takes place, and extends to ſome diſtance round the ulcer, and even ſurrounds the whole joint. But in very confirmed ſcrofulous habits, it is not unuſual for the whole glandular ſyſtem to be diſeaſed. In ſome ſubjects, the vertebræ of the back and loins even become carious; abſceſſes form and break, ſometimes on one, ſometimes on both ſides of the ſpine, and theſe occaſionally become ulcers of greater or leſs extent.

There is one circumſtance of which writers on the ſcrofula have not taken notice, but which ſeems deſerving of a place among other facts; and that is, that infants and young perſons of both ſexes frequently are cut off by an high degree of ſcrofula affecting ſome, or almoſt all, of the viſcera, whilſt not the ſmalleſt external ſign of the diſeaſe has been found to exiſt. In ſome of theſe caſes the lungs, liver, ſpleen, &c. are ſtudded with ſcrofulous knots; and in others, thoſe parts are exempt, whilſt the whole meſentery is affected, glands and all, with a ſcrofulous enlargement of the thickneſs of one's hand. An inſtance of the latter kind occurred in a boy of 12 years of age, who, after an illneſs of two or three days, the hiſtory of which could not be ſatisfactorily collected, died quite unexpectedly. On diſſection, the only appearances that could be diſcovered were thoſe juſt deſcribed; nor was there any degree of inflammation that could account for the patient's death. What is ſtill more ſingular is, that notwithſtanding the impervious ſtate of the lacteal veſſels of the greater part of the meſentery, the boy was very ſufficiently nouriſhed, and, though not remarkably luſty, he had a florid and healthy appearance, and had been accuſtomed to a laborious employment.

The cure of the *ſcrofulous ulcer* is chiefly to be attempted, like that of other ulcers of a ſpecific character, by combating the diſeaſe of the habit. That the ſcrofulous diatheſis is exceedingly difficult to ſubdue, we have many and reiterated proofs; and ſo little encouragement have we hitherto met with in our attempts to accompliſh it by medicine, that it would be of little uſe to detail here, with any

great degree of minuteneſs, the different remedies that have been, from a very early period to the preſent time, preſcribed by medical practitioners with this intent.

Suffice it then to ſay, in the firſt place, that a multiplicity of remedies, of a *vegetable* kind, and of that claſs properly called *antiſcorbutic*, have been ſucceſſively tried. But of theſe, none, except cinchona, mezereon, cicuta, and ſarſaparilla, have any pretenſions to efficacy, and many practitioners are inclined to deny it even to the laſt two. Many other of the narcotic plants, as well as cicuta, have been tried, and with various degrees of ſucceſs; but there is reaſon to believe, that their qualities are better adapted to the treatment of the phagedænic ulcer; as we ſhall have occaſion to obſerve in another place.

From the *mineral* kingdom we have been ſupplied with antimony, zinc, arſenic, terra ponderoſa, and quick-ſilver. From the firſt of theſe occaſional good effects have certainly been obſerved; and for that reaſon it has been very properly introduced by the London College into the formula, named decoctum ſarſaparillæ compoſitum. Every practitioner, however, ought to be aware of the debilitating effects of antimony, thoſe preparations of it, at leaſt, which are formed by its union with an acid. It is true, the diſeaſe ſometimes occurs in perſons apparently robuſt, and who may be ſuppoſed prone to phlegmonous inflammation. In ſuch, perhaps, the uſe of antimony may have been attended with good effects; yet, if we decide that antimony, which is a *relaxant* of the moſt powerful kind, be a ſuitable remedy in ſcrofula, how can we conſiſtently reckon the bark and other *tonics* to be ſo? It is impoſſible, perhaps, to reaſon on this ſubject; we ſhall, therefore, only obſerve, that, of all the preparations of antimony, none are found ſo ſuitable in this diſeaſe as the *ſulphur antimonii præcipitatum*, which ſeems to be in a great meaſure exempt from thoſe objections juſt now ſtated to exiſt againſt moſt other chemical preparations of antimony.

On the uſe of *zinc*, we can only rely in a general way as a tonic. The *vitriolated zinc*, in ſmall doſes, is entitled to its ſhare of commendation in ſome occaſional inſtances; and many ſurgeons give it in the more active form of the *flowers*, (*zincum calcinatum*).

Arſenic is not often reſorted to as a remedy in the ſcrofula, nor have the trials made of it been ſo ſucceſsful as to warrant the uſe of a remedy ſo extremely hazardous in every form. That preparation of it uſed in St. Bartholomew's hoſpital, under the name of *kali arſeniceatum* (in the doſe of one-ſixth of a grain, to adults, three times a day), is, perhaps, the leaſt objectionable of any of the preparations of that mineral that have yet been invented.

Of *terra ponderoſa*, contrary to the expectation of every one who knew the great abilities and integrity of its panegyriſt, the late amiable and excellent Dr. Adair Crawford, experience has unhappily left us nothing to ſay. It, undoubtedly, *appeared* to have ſucceeded

in three moſt deciſive caſes of ſcrofula that were treated in St. Thomas's hoſpital. That the patients *got well* is moſt certain; and that under the *uſe* of this very active remedy, combined with the muriatic acid. The compoſition of this remedy is deſcribed in the Pharm. Chirurgica; but why it failed in every ſubſequent trial, whether by Dr. Crawford himſelf, or others who were equally diſpoſed to attribute good qualities to it, it is not poſſible to ſay. The general impreſſion, however, is, that this mineral poſſeſſes no power of checking the ſcrofulous diatheſis, as has been ſuppoſed.

Of *quickſilver*, heretofore, and even now, a favourite remedy with the bulk of practitioners who have occaſion to treat this diſeaſe, we have little to advance in the way of commendation. On the contrary, it is moſt juſtly chargeable with a variety of miſchiefs, which have been freely attributed to the peculiar obſtinacy of the complaint. As one of the properties of quickſilver is known to be that of exciting the action of the abſorbent ſyſtem, and, by that means, removing local hardneſſes, and particularly thoſe of glandular parts, it was, and with great appearance of reaſon, thought an adviſable remedy in a diſeaſe exhibiting thoſe particular ſymptoms in ſo remarkable a degree.

Wiſeman, the moſt judicious of all the practitioners upon the old principles, employed mercury copiouſly in ſcrofula, as appears from the following paſſage in his "Method of Curing the Evil." Alluding to the complications of which this diſeaſe had been ſuppoſed capable, he ſays, "In truth, whatſoever diſeaſe it is complicated with, *without ſome preparation of mercury, our hopes are vain*; nay, in ſome of the moſt deplorable caſes where the patient hath been *much emaciated*, by reaſon of the *acidity of the ſerum**, I have proceeded higher to *ſalivate them*, and thereby recovered them," &c. To explain the cauſe of his ſucceſs in theſe caſes, however, it may be neceſſary to attend to the context, in which he refers the reader to his "Obſervations on Ulcers with *Caries in the Bones*," many of which, probably, were *venereal* rather than ſcrofulous.

It may farther be obſerved, that Wiſeman's general object in giving mercury, was that which, in theſe days even, is ſomewhat admiſſible, though, by no means, to the extent which he thought proper to carry it. His object was to adminiſter one of the preparations of quickſilver, namely, calomel, as a *purgative*; a way in which its ſpecific, and what we conceive to be its prejudicial, effect on the conſtitution is not to be expected. To make more ſure of this effect, indeed, he never failed to join with it "*pil. cochiæ, pil. e duobus rudii*," or ſome other powerful draſtic: ſo that, although his expectations of ſucceſs were grounded on the action of mercury on the *ſyſtem*, and not merely as a ſtimulant applied to the bowels, it is

* Wiſeman's acquieſcence in this received doctrine of his time, is not remarkable; and although this cauſe of ſcrofula may juſtly be deemed ſuppoſititious, modern times have not ſupplied us with a better.

probable they were not anſwered in thoſe ſucceſsful caſes of which he ſpeaks, but upon a principle which he did not comprehend. Every ſurgeon, indeed, muſt be ſenſible of the truth of this who is aware of the palpable and indiſputable fact, that *purging* and *ſalivation* are not compatible in practice; and that the latter cannot be accompliſhed, or, if at all practicable, is accompliſhed with difficulty, whilſt mercurials operate violently on the inteſtines in the courſe of their being adminiſtered.

In making theſe remarks on the practice of the honeſt and illuſtrious Wiſeman, we are commenting, not only on what was the univerſal practice of his time, but on what, under ſome certain limitations, has exiſted ſince, and is even the practice of the preſent day. It is evident he was acquainted with all the remedies uſed in ſcrofula at preſent, except, indeed, that very important one, Cinchona, of which he could have no knowledge. Remedies of the *tonic* claſs were not then had recourſe to in the ſcrofula; nor were the good effects of ſea-bathing known: but antimony, particularly that preparation called *diaphoretic*, was in uſe; and alſo burnt ſponge, a remedy in no inconſiderable repute at preſent. Sarſaparilla, China root, and other vegetable ſubſtances, to which Wiſeman gives the name of "antiſtrumous," were employed moſt abundantly, and, on the whole, with the ſame degree of advantage as at preſent, which is but little.

Modern practice has, indeed, introduced the uſe of a vegetable which was unknown to the earlier practitioners, and which has the teſtimony of ſome eminent men in its favour, I mean *mezereon*. The late Mr. Hunter ranks it in the firſt order of vegetable ſubſtances to be reſorted to in the ſcrofula. He directs it, however, in conſiderable quantity; and it unfortunately happens, that the taſte of it is ſo exceedingly acrid and naufeous, and its action on the ſtomach ſo liable to produce ſickneſs, that few patients can be prevailed on to carry the trial of it ſufficiently far to aſcertain what its properties really are.

But to return to the ſubject of our objections to the uſe of quickſilver, or any of its preparations, in the ſcrofula; it is only neceſſary to appeal to the experience of thoſe who have witneſſed its effects in venereal caſes. Nothing is more common than to ſee the ſcrofula ſuperinduced by a mercurial courſe, in conſtitutions which before remained unaffected with it. Nothing, in fact, forms ſo great an impediment, as does the ſcrofula thus excited, to the ſurgeon's endeavours to deſtroy the venereal virus.

Glands, brought into a ſtate of inflammation by the irritation of a chancre, and which, if left to ſuppurate, would go through that proceſs favourably, are very commonly rendered ſcrofulous by the quickſilver rubbed in with a view of diſperſing the tumor. Venereal ulcers of the throat are, by the ſame means, converted into ſcrofulous ulcers; and whilſt mercury continues to act on them, that

diſpoſition is increaſed. Hence we are compelled to change our plan even before the venereal diſpoſition in the part is overcome, and to reſort to the bark, the "antiſtrumous vegetables," and ſea-bathing, to counteract the ſcrofulous diatheſis which the mercury has brought on.

But, admitting there ſhould occur none of theſe *external* ſigns of the miſchievous effects of quickſilver in habits prediſpoſed to the ſcrofula, it, nevertheleſs, often happens, that *internal* and more fatal ones take place. Some of the viſcera are brought into a ſtate of diſeaſe; the lungs more eſpecially; and when this happens in a perſon who has had a venereal infection, the phthiſis brought on by the remedy is called a *venereal conſumption*; and the patient more certainly getting worſe as the ſpecific for venereal infection is adminiſtered, at laſt dies in conſequence of the treatment.

What has been ſaid may, perhaps, be ſufficient to awaken the attention of medical men to what, if true, is a fact of great practical importance. The effects here attributed to mercury, are not, perhaps, obſervable in every inſtance of its exhibition in a ſcrofulous habit; but that it is truly liable to the ſerious objections we have brought, is a fact, which, now and then at leaſt, is confirmed by ſome ſtriking and fatal inſtance *; and it is devoutly to be wiſhed, that a cloſe attention to what happens in thoſe caſes where mercury *muſt* be employed, and where, after its exhibition, ſcrofula *does appear*, may throw ſome farther light upon the ſubject. But, notwithſtanding what is to be apprehended from the full conſtitutional effect of mercury, there are ſome preparations of that mineral, calculated to act ſimply on the *inteſtines*, which, far from deſerving our reprobation, have, on the contrary, moſt ſalutary effects in the treatment of the ſcrofula.

There is, perhaps, no article in our liſt of purgatives which ſo effectually evacuates the inteſtines, and produces that effect with ſo little irritation and diſturbance, as the preparation we call *calomel*. Some purgatives act by increaſing the ſecretions from the inteſtines, and others by aiding their periſtaltic motion; but there is hardly any ſingle article of the materia medica, from which, in both theſe ways,

* It may ſeem to the reader, that more is ſaid on this ſubject than is required by the object of this ſection, which is to ſpeak of the *Scrofulous Ulcer* and its treatment. He will perceive, however, as has already been ſuggeſted, that an immediate and neceſſary connection exiſts between the treatment of the general diſeaſe and this local ſymptom of it, and that it is no leſs neceſſary, in ſpeaking of the internal remedies employed by ſurgeons, to diſtinguiſh thoſe that ought to be avoided, than it is to beſtow juſt encomiums on thoſe that deſerve it. We have, in fact, been led to ſome length in this part of our ſubject, from knowing, that a modern treatiſe on the ſcrofula, in other reſpects judicious, adviſes a *reliance on mercury* for the cure. That we are not indiſpoſed to give *calomel*, uſed as a *purgative*, its due ſhare of commendation, will be ſeen in the ſequel; but beyond that, we cannot but feel the importance of oppoſing the uſe of quickſilver in any form, except, perhaps, that of a topic, which may, in ſome inſtances, be expedient.

effectual and general evacuation of the bowels can be obtained, unleſs it be this excellent preparation, which has been known, in various inſtances, to perform the taſk, when other cathartics, under various modifications, have proved uſeleſs.

In ſcrofulous ſubjects, there exiſts a great diſpoſition in the veſſels to throw out coagulable lymph. Hence it is that, in ſuch perſons, freſh inciſed wounds heal by the firſt intention with ſingular rapidity; and even in large operations, ſuch as amputation, there exiſts an aſtoniſhing tendency in the parts to contract, and, as it were, *glue* themſelves together, the ſurface that remains unhealed, being nevertheleſs impeded, by thick coats of coagulable lymph ſucceſſively thrown out, and which demand the application of eſcharotic remedies.

This diſpoſition is more particularly evident in ſubjects of the fat, chubby, and florid deſcription; but it may alſo be traced in ſome of the emaciated ſort, and there appears to me a probability, that this diſpoſition prevails pretty univerſally in the glands, thoſe more eſpecially concerned in ſupplying the ſecretions natural to the primæ viæ. Hence, perhaps, we may account for (what is a well known circumſtance occurring in ſcrofulous perſons, particularly children), the inactivity of the bowels, and the glairy nature of their ſecretions, which form a convenient nidus for worms, and other lodgments, that would not be retained if the periſtaltic motions were more vigorous.

But whether this ſtate of the inteſtines may, or may not, be truly accounted for on theſe principles, its exiſtence in ſcrofulous ſubjects is an acknowledged fact; and it is alſo very generally allowed, that the occaſional removal of theſe pernicious accumulations by a ſuitable purge, far from adding to that debility, which, according to many, has a principal ſhare in the diſeaſe, actually affords ſtrength, by removing the impediments to nutrition, and ſtimulating the languid mouths of the lacteal veſſels.

Every remedy adminiſtered by the mouth, and which occaſions inteſtinal evacuation, goes under the general character of a purge; and it is common to medicines not of that claſs, ſuch as the bark, when given in an over-doſe, to act as cathartics. But, as has already been obſerved, thoſe medicines which produce ſtools by increaſing the ſecretions from the glands of the inteſtines, do, by no means, the ſame thing as purgatives which prove ſuch by augmenting the periſtaltic motions. In the latter caſe, the inteſtines are merely excited to expel the fæces which happen to be contained in them; in the former, a conſiderable addition of fluids takes place, which renders the fæces more liquid, and cauſes the natural motions of the inteſtines to protrude their contents more expeditiouſly towards the rectum than would happen if the fæces remained ſolid.

It is needleſs to enumerate the different articles of the materia medica to which theſe diſtinct properties are attributable, as there is

no professional man so inexperienced as to be ignorant of them. Indeed, they will fall under our notice in another place; here it is sufficient to observe, therefore, that all the saline purgatives, as Glauber's, Epsom, Rochelle, and other salts, act by increasing the secretions; whilst rhubarb, senna, aloes, and many other vegetable purgatives, act chiefly by increasing the peristaltic motions. It is owing to these distinct qualities which belong to the class of cathartics, that we are in the daily habit of combining them, in order to insure a beneficial co operation, and thus evacuate the intestines more effectually than could be done by the administration of any of them singly.

There is another property, with regard to purgatives, which is not less worthy of notice; and that is, the disposition manifested by some of them to act exclusively on *particular parts* of the alimentary canal. It is not easy to state, even with the appearance of accuracy, what is the nature of these *peculiar affinities*, if we may so call them; but that the general fact is so, has been sufficiently proved by the well-known property of aloes to act exclusively on the rectum.

But as it forms no part of our design to enter into these speculations farther than may be warranted by their connection with the general subject of ulcers, or than may tend to shew the propriety with which a mercurial preparation may be used in scrofula as a purgative, notwithstanding its mischievous effects when given with any other view; we shall cut short this digression, by merely repeating, that, among the few remedies which act at once by increasing the secretions from the mucous membrane of the intestines, by augmenting the peristaltic motion, and by an uniformity of operation on the whole intestinal canal, there is, perhaps, none equal to calomel: and it is to the possession of these qualities *alone*, and not to its power of acting specifically on the *system*, that the merit ascribed to it by Wiseman, and other writers, should be attributed.

A remedy in the scrofula, on which, heretofore, practitioners have had great reliance, is *burnt sponge*. Some, however, attribute the good effects of it solely to the mineral alkali contained in it; and on that account, substitute what, in the new language of the College, is called *natron*, as a less inelegant medicine. The popularity of this remedy is, in a great measure, owing to its apparent success in the treatment of the Derbyshire neck; though it is by no means clear, that the co-operating remedies employed in the cure of that complaint, namely, calomel, and other purgatives, have not a very material share in the process.

Speaking then of burnt sponge as of mineral alkali, may not its action, besides that to be expected through the medium of the circulation, be traced to something analogous to a course of purgatives? Or, at least, may not it have the effect of dissolving or decomposing

that adhesive mucus, which we have supposed, in this disease, to interfere with the healthy actions of the intestines?

It is not, perhaps, to be denied, that one of its modes of operation, is that of a kind of universal stimulant; for there is great reason to suppose, that, in common with turpentine, and some other substances, alkalies enter the blood vessels, without undergoing any change in the stomach. But, at least, that they may pass through the first passages without undergoing the process of assimilation, may be fairly conjectured, from their known property of entering the bladder, and acting as solvents on urinary calculi. In their course, therefore, through the bowels, we see no difficulty in supposing, that they combine with, and tend to carry off, those glutinous secretions which obstruct the mouths of the lacteal vessels, and thus produce silently, and by a sort of chemical combination, the same effect as is to be expected from the occasional exhibition of purgatives.

Dr. Cullen, speaking of the class of remedies termed *attenuantia*, includes a subdivision termed *resolventia*, which, he says, "are properly such substances as give *fluidity* to portions of our fluids that had been *formerly concreted*." Among the remedies of this description, it is worthy of notice, that he has included both the fossil and volatile alkalies. May not these *resolve* the *concreted lymph*, which seems to constitute the disease in the case of scrofulous tumors?

But whatever be the modus operandi of this remedy, it is certainly amongst those that occasionally prove serviceable in the scrofula, and that even in very inconsiderable doses. If given largely, indeed, and for a length of time, it may prove injurious to the system; and for that reason, perhaps, it is, that, with most practitioners, the very small proportion usually exhibited when the form of *burnt sponge* is preferred, is found to answer better than natron in its *prepared* state.

From speaking of the effects of mineral alkali given internally, we come to consider the uses of *sea bathing* in the scrofula. It has been very unwillingly granted by some writers, that bathing in salt water is of greater efficacy than bathing in any other sort of water of the same temperature; for, say they, it is alone the *tonic* effect of the cold, suddenly and universally applied to the body, which is of service; and this effect may be produced equally well by immersion in fresh water. Not to advert to the multitude of facts which militate against this supposition, we may reasonably suppose, that so general an application of salt to the skin is attended with some share of advantage, for common salt is a compound in which the mineral alkali predominates; and from daily immersion, no doubt, considerable quantities of it must be absorbed. We would not, however, be supposed to contend, that the good effects of sea bathing in the scrofula depend upon the application of salt to the surface of the body. On the contrary, we admit its inferiority to sea water as a cold bath; yet

we are, nevertheleſs, diſpoſed to conſider the ſalt as no deſpicable or unneceſſary agent in the reſult.

Perhaps, however, we ſhall not give to this remedy of ſea-bathing its full ſhare of credit, if we do not alſo take into the account the effects of *ſea air* on the conſtitution. We well know, that the air on the ſea coaſt is loaded with ſaline particles, which enter the lungs on inſpiration, and alſo apply themſelves continually to the whole ſurface of the body. That this is the caſe, does not admit of a doubt, ſince the particles of ſalt are taſted as they fall on the lips of thoſe who walk at ſome diſtance from the ſea; and that this ſlight application of ſalt alone to the body, is capable of doing *ſome* ſervice in ſcrofulous diſeaſes, is manifeſt from the following caſe:

"A gentleman, between twenty and thirty years of age, very healthy in other reſpects, had a foul ulcer with thick and curling boundaries on the edge of his tongue. Its commencement for ſome few weeks was marked only by a ſmall lump, or thickening of the part, which at laſt gradually opened by a kind of fiſſure, diſplaying an ulcer with a foul buff-coloured ſurface, which increaſed, in the courſe of a few months, to nearly the dimenſions of a ſix-pence. The diſeaſe, however, manifeſted itſelf much beyond this, by the ſwelled ſtate of the ſurrounding parts. The patient, while in this ſituation, had occaſion to take a ſudden voyage to the continent, and being apprehenſive, though the pain and inconvenience he then felt, were not ſo conſiderable as, from the appearance of the ſore, might reaſonably have been expected, that the diſeaſe might proceed to a ſerious length if neglected during ſo long a journey, he thought it adviſable to apply to a profeſſional gentleman, by whoſe inſtructions he might be guided in the treatment of it, and from whom, indeed, he received a ſupply of ſuch medicines, both topical and for internal uſe, as the ſtate of the ulcer ſeemed to require. The hurry of preparation, however, interfered with his intention of making ſome uſe of his medicines even before his embarkation; and, in fact, nothing was done; but to his great ſurpriſe, during his detenſion for a few days on the ſea coaſt, the ulcer in his tongue, which had exiſted for ſo long a time, healed up; his medicines were conſigned to the jaws of the *ocean*, and he has remained perfectly free from the complaint ever ſince."

As in this caſe there could be no other application of the ſaline particles, either topically, or to the ſyſtem, but what was effected through the medium of the ſea breezes; as *no medicine whatever* was uſed by the patient; and as the diſeaſe was gaining ground during his continuance in London, the place of his ordinary reſidence; what can be the concluſion, but that the ſtate of the atmoſphere on the ſea coaſt occaſioned the cure?

But let us now conſider ſea bathing in the light of a tonic, in which moſt people view it, and certainly not without good reaſon. If immerſion in the ſea were unattended with the concomitant bene-

fits of which we have been ſpeaking, it would, of courſe, rank no higher as a remedy for the ſcrofula, or, indeed, any other diſeaſe, than freſh water of the ſame temperature. The tonic effect is produced merely by the ſudden and univerſal application of cold to the ſurface of the body, by which the extreme veſſels are invigorated, and a more equable circulation of the blood in them is occaſioned. The ſudden conſtriction of the veſſels of the ſkin, cauſes the blood to retreat back upon the viſcera; and, by that ſalutary ſtimulus, is inſtrumental in exciting in them an unuſual degree of exertion to reſtore the equilibrium of the circulation. This exertion, it is likely, produces tone and vigour in parts whoſe functions before were languid, and it is thus, perhaps, that in glands affected with ſtruma, a beneficial change is produced. The opportunities of immerſion in cold freſh water, are, undoubtedly, within the reach of every one; yet the trials made of it by ſcrofulous patients, ſo circumſtanced as not to have the opportunity of bathing in the ſea, are, by no means, ſuch as to put theſe two remedies on an equal footing, or to ſupport the opinions of thoſe who rely on the mere *tonic* properties of ſalt water.

Since we know, however, by chemical analyſis, in what the ſea differs from freſh water, ſomething is to be done by introducing a ſuitable proportion of ſalt into the water in which the patient deſigns to bathe. The quantity neceſſary is about 5lb. to every 12 gallons of water. This, at leaſt, may be conſidered as ſomewhat preferable to freſh water alone, yet experience proves it far inferior in efficacy to that element of which it is deſigned as an imitation, for the reaſons which have been already ſuggeſted.

Since the opportunities of *warm ſalt water bathing* have become frequent on the ſea coaſt, a variety of inſtances have occurred, in which eſſential benefit has been derived from the uſe of this remedy. For internal, as well as external, ſcrofulous affections, for thoſe of the meſenteric, and other glands, for white ſwellings, diſeaſes of the proſtate, ulcers, and various other forms in which the ſcrofula is liable to occur; it has been demonſtrated, that the tepid ſalt-water bath has, at leaſt, been of as great, but, in ſome inſtances, of much greater, ſervice, than ſea water when uſed in the ſtate of its natural temperature.

If this be the caſe, what becomes of the principle on which ſea bathing is ſo univerſally, and almoſt excluſively, ſuppoſed to counteract this diſeaſe? Is the effect, called *tonic*, capable of being produced by any degree of relative warmth? Or is the term ill calculated to expreſs the effect *really occaſioned* by *cold* bathing? But let us now proceed to conſider the properties of a remedy of late years more implicitly confided in than, perhaps, any other, in the treatment of the ſcrofula: this remedy is the Peruvian bark.

That this medicine, of ſuch excellent uſe in various other diſeaſes, is alſo an important one in that now under our conſideration,

cannot be denied; and, perhaps, there is scarcely any state of the disease for which it is so well calculated as the scrofulous *ulcer*. The great misfortune is, that it requires to be administered, not only in considerable quantity, but also for a great length of time, to produce any very obvious good effect; and the scrofula, in every form, is a disease of so protracted and slow a nature, that scarcely any one can persevere sufficiently in the use of it. But, if this be the case with adults, how much more does it form an objection, when it is required to administer this remedy to children, the most usual subjects of the disease of which we are speaking? These are, in fact, precluded wholly from the benefits of it.

"The bark," says Dr. Cullen, "has been employed in scrofulous cases. The scrofula is attended with ulcers *mali moris*, depending on a *flaccidity of the vessels of the part*, and of the *system in general* very often; so that here the bark is plainly indicated; and I make no doubt of the success had by Doctors Fothergill and Fordyce in such circumstances. But it must be observed, that the bark *very often fails* in this disease. Even these gentlemen have not always succeeded, because, I imagine, this disease is often not to be cured *certainly* by *any* medicine; for it seems often a disease of the *lymph* seated in the lymphatic vessels, and not depending so much on a *general flaccidity of the system* as in some particular affection of the lymphatics, and *matter generated there*."

This account being sufficient for our present purpose, it is unnecessary to add to it; and especially as the subject will again fall under our notice when we come to describe the general treatment. There remains only one more remedy, or class of remedies, on which it is necessary to remark, and these are *stimulants*, the most appropriate of which, and that to which we shall chiefly confine ourselves, is *volatile alkali*.

Of the various stimuli which the materia medica supplies, there is none, perhaps, so appropriate to our purpose as this; and the reason very naturally suggests itself from what has already been observed on the use of mineral alkali. Superadded to the effect which may be expected of it as an alkali, we have also that of a stimulant of extraordinary power, and one with which the stomach will dispense much more largely than its sensible effect on the organs of taste and smell seems to indicate*.

There can be no doubt of the propriety of classing stimulants amongst the remedies necessary to be employed in a disease where debility is so leading a feature; provided their effects can be rendered permanent by the use of the bark, of which there is no question. We shall not, however, dwell on this subject in particular, but proceed to consider in what way the remedies of which we have

* "If, by any means, we could defend from its action the mouth and fauces, it might be thrown into the stomach in a *large dose*, even without inconvenience." CULLEN.

made mention, or some of them, may be employed with the greatest effect in the scrofula.

In entering on this topic, it may not be improper to premise, that we propose to confine ourselves to the treatment of those scrofulous affections which are external, and which we will suppose to arise in the *adult* subject; because, in infants, we are precluded the use of many of our best remedies, and must, therefore, of necessity, rely on those whose qualities are somewhat inferior, but possess the advantage of being more easy to administer. On this occasion too we propose to speak of the use of topical remedies, which have not as yet been adverted to.

Let the external signs of scrofula in the patient be what they may, our first endeavour must be to reach them through the medium of the constituion. Here, to say nothing of the means already spoken of, what a host of remedies present themselves, equal alike in their powers, and in their deficiencies! On which of these, after the experience of so long a period, an experience which has decided so little in their favour, shall we fix our choice? We must, at least, resort to those on which the sentence of *positive inefficacy* has not yet been passed, in preference to those which the united judgment of medical men seems to have rejected. Those which are *under* trial, are, at least preferable to those that have been *fully tried*, and *found wanting*.

If the scrofula has manifested itself, as it most frequently does, in the form of an enlarged gland, advancing daily in size, and threatening to terminate in suppuration, its progress should be counteracted by the use of every kind of topic that is likely to diminish the latent and deep-seated inflammation in the part. For this purpose, cold lotions, of a variety of kinds, are in use; such as lead-water, aqua ammoniæ acetatæ, lime-water, solutions of vitriolated zinc, of muriated ammonia, of alum, &c. It is common to apply these upon bits of linen rag, laid one over the other, to a sufficient thickness, and kept continually wet by repeatedly dipping those on the outside. It is difficult to say which of these applications answers best; or even whether they are any of them of much service. Some practitioners rather prefer the use of liniments, of the kind named discutient; such as a simple solution of soap in brandy; or the same remedy joined with an equal quantity of the water of acetated ammonia, or with a small quantity of water of acetated litharge. Some employ liniments of a moderately stimulating kind; probably with a view of exciting the absorbents to action. The composition of these is various: olive oil, with spirit of hartshorn, or water of pure ammonia; or a solution of soap with the latter addition; or the composition, called *embrocatio ammoniæ* in the Pharmacopœia Chirurgica.

Other practitioners resort to plasters, in which discutient, or repelling remedies, are variously combined; and from these, if not

compoſed of ingredients of too ſtimulating properties, very favourable effects ſometimes reſult, though the event is almoſt a matter of accident.

Speaking generally, indeed, of all theſe remedies, there is very great uncertainty as to their effects. They either do nothing, or if they act at all, they are juſt as liable to forward as to retard ſuppuration. The ſame may alſo be ſaid of the like remedies employed in the form of fomentations or poultices. Plaſters, indeed, are to be excepted from the charge of inactivity, for, independent of the properties of the ſubſtances which compoſe them, they act by confining the perſpiration, and, undoubtedly haſten the criſis of the tumor in one way or other.

To impede the progreſs of any ſcrofulous ſwelling, and prevent its becoming an *ulcer*, we ſhould, in the firſt inſtance, draw blood from the part, by the application of a ſufficient number of leeches; repeating this ſeveral times ſucceſſively, at intervals of three or four days, or a week, according to the effect produced. We ſhould alſo, without delay, preſcribe an emetic of vitriolated zinc, and repeat it twice or thrice; or we ſhould adminiſter ſome purgative and emetic remedy united, ſo as to produce a moderate evacuation in both directions. This latter effect may be very conveniently obtained, by a doſe of calomel joined with a very ſmall proportion of tartarized antimony; a formula extremely well calculated for children.

In the intervals between the application of the leeches, as it will be thought right to be doing ſomething, and to take even a *chance* of promoting the great object of diſperſion, we ſhould apply the water of acetated ammonia to the part, or a ſolution of muriated ammonia in brandy, or even a ſolution of common ſalt in water, in the proportion of one part to twenty-eight. If it can be had, we may uſe, in preference to the foregoing, a poultice of the well-known marine plant, called *ſea tang*, bruiſed in a mortar, and applied cold, a remedy approved of by the late Mr. Hunter.

The *ſea tang* is the *fucus veſiculoſus* of Linnæus. The virtues of this plant have been copiouſly ſpoken of by Dr. Ruſſel, in his treatiſe on the uſe of ſea water in diſeaſes of the glands. He conſiders the ſaponaceous liquor contained in the veſicles of this plant as an excellent *reſolvent*, and recommends the ſcrofulous tumors to be well rubbed with it (after bruiſing the plant with the hands), waſhing them afterwards with ſea water. He recommends for the ſame purpoſe the following method to be taken:—Having gathered two pounds of the *veſicles* of this plant, in the month of July, infuſe them in a quart of ſea water for a fortnight, when the liquor will have acquired the conſiſtence of honey. The ſwellings are to be rubbed with the ſtrained liquor three or four times a-day, waſhing them afterwards with ſea water. It is very probable that the ſcrofulous *ulcer* would be benefited by a ſome-

what similar treatment, where there is an opportunity of putting it in practice.

If, under the treatment here recommended, the swelling nevertheless gives pain, the inflammation seems to gain ground, and the skin becomes red, we may try the effect of pounded ice applied to the part, and renewed as fast as it melts away; and this should be persevered in till the inflammatory disposition subsides.

In some cases, where the swelling is particularly indolent, increasing only in *size*, and without shewing any other disposition, the best effects may be expected from the use of a liniment composed only of vitriolic acid and olive oil, in the proportion of one dram to an ounce of the latter. Some have also been benefited by the use of the linimentum bituminis ammoniatum, a remedy employed as "a most powerful *dissolver of thickened lymph*," by Dr. Kirkland.—In some, a plaster has been of service, composed of equal parts of the quicksilver and warm plasters, and lightly sprinkled towards the centre with camphor finely powdered.

The other remedies necessary to be used, as well to prevent the progress of a tumor to the state of a scrofulous ulcer, as to promote the cure of the latter when established, are, sea bathing, if it can be had, or the artificial sea-water bath already spoken of; the use of natron internally, either *per se*, or in the state of burnt sponge; the occasional exhibition of calomel, as a purge; a copious and persevering exhibition of the bark; and joined with it, if not likely to occasion disgust in the patient, a good proportion of volatile alkali.

The bark will, in general, be found most effectual, when exhibited after a course of calomel purges have been persevered in, or where emetics have been premised. It is expedient, indeed, in most cases, to employ these means *alternately*; for the bark will, after a time, lose its effect; and, in that case, the use of calomel purges should be adopted, and, after a while, the bark will again be found to succeed as well as at first.

Decoctions of sarsaparilla and mezereon, in conjunction, or separately, are not to be rejected, when more promising remedies seem to fail, or where the opportunity of employing them is particularly favourable. Many patients are soon disgusted with the bark, no less on account of its nauseous taste, than its appearance, when employed in substance: and when this is the case, it is some relief to them to use decoctions of sarsaparilla, &c. in its stead. Much of the disgust, however, arising from the taste of bark, is to be attributed to its *astringency*, and this is remarkably overcome by its being taken in milk, or, according to some, in mucilage of gum arabic.

The *scrofulous ulcer*, though, in most cases, it is found to affect glandular parts, and to arise from the suppuration of the glands themselves, is, nevertheless, frequently seen in other situations.

There is, indeed, no part of the body where it may not exiſt, and its appearance on the extremities is ſcarcely leſs common than on the neck, breaſt, &c. It is particularly liable to occur in thoſe places where the diſeaſe has reached the bones; and will often remain, and extend itſelf, after the caries is got the better of. It alſo forms a deſcription of ulcer very difficult of cure in the legs, ankles, and feet; becauſe, independent of the obſtacles formed by the ſpecific character of the complaint, we have to contend with thoſe impediments which are common to every ulcer in the ſame diſadvantageous ſituation.

This kind of ulcer is not attended with any ſtriking marks by which its ſpecific nature may be diſtinguiſhed. It may, however, be pretty accurately diſcriminated by the concomitant ſymptoms and appearances, its ſituation, &c. The diſcharge is likewiſe of a curdled, whitiſh, unnatural appearance; the edges of the ſore are thick and projecting; and the ſurrounding parts are tumid, and inſenſible in general, though in ſome caſes, very painful.

It has been already obſerved, that the treatment of this ulcer depends almoſt wholly on the treatment of the diſeaſe in the ſyſtem. Nevertheleſs, there is ſomething to be done by means of local applications; at leaſt, it is indiſpenſably neceſſary, that every precaution required in the treatment of a common ulcer, ſhould be regularly and attentively obſerved in this; ſuch as a daily renewal of the dreſſings, and every regard to cleanlineſs, as well as to the circumſtances under which motion or reſt ſhould be enjoined.

If bathing in the ſea can be had, it is of ſervice to expoſe the ulcer at the time of going in, and the ſame if an artificial ſea-water bath be uſed; or if circumſtances do not admit of either of theſe, the ulcer may at leaſt be waſhed daily with cold ſalt water, ſprinkled over it by means of a ſponge; this, indeed, ſhould be a preliminary to every other dreſſing that may be intended.

The topical applications ſuppoſed to facilitate the healing of the ſcrofulous ulcers are exceedingly numerous; but we ſhall here only notice thoſe few that experience has moſt entitled to a preference. Solutions of natron; or of acetated ceruſe; of vitriolated zinc; of muriated quickſilver; of ammoniated copper; or of nitrated ſilver; are each worthy of a trial: and theſe ſhould either be bruſhed over the ſore with a camel's-hair pencil, or applied on pledgets of lint.

There is ſome reaſon to fear, that common ſalves, and greaſy applications, rather do miſchief; they are therefore to be avoided, if poſſible, even as *outer* dreſſings, but much more ſo as dreſſings to the ulcer itſelf. Where their great convenience overbalances theſe conſiderations, with regard to the former purpoſe, much of the objection may be obviated, by a choice of ſuch ointments as include in their compoſition an ample proportion of ſoap; for by

that the clamminess of such salves is prevented, and the dressing, when taken off, leaves the surrounding skin clean and unsmeared.

There are, however, some formulæ which are exceedingly well adapted to the treatment of the ulcer itself, and which yet admit of oil, &c. among their ingredients, as a means of incorporating other substances. These compositions are too numerous, and on too equal a footing, with regard to their virtues, to require any circumstantial account in this place. We should therefore observe in a general way, that the most serviceable applications to scrofulous ulcers, are those ointments which include mineral alkali, neutral salts (as the vitriolated natron), volatile alkali, quicksilver in the nitrous or muriatic acids, honey, or the juices of narcotic vegetables. Indeed few remedies succeed better than a composition of *unguentum picis* united with such a proportion of *sal cornu cervi* as will just stimulate without inflaming the ulcer. It must be observed, however, that when this ointment is employed, it should be mixed at the time of dressing the wound; as otherwise, its qualities will be impaired by the escape of the volatile parts of the salt into the atmosphere. Next to this, we know of no better ointment than the ceratum mellis (Pharm. Chirurg.) prepared with the emplastrum lythargyri cum gummi.

It would be superfluous here to repeat the directions already given, but which it will be necessary the surgeon should observe, in a greater or less degree, in the treatment of ulcers of a specific character: for whilst the necessary internal remedies are employed, to counteract the disease in the system, no diligence should be wanting in the choice and management of such applications as may dispose the ulcer to heal. This, indeed, it may be sufficient to mention here, once for all; as this remark will be found to apply, no less with regard to the subject of which we have been treating, than to those we now proceed to examine.

Sect. X. *Of the* Phagedænic Ulcer.

Till the appearance of a late ingenious work on the Phagedænic ulcer by Mr. Adams, very erroneous and inadequate notions were entertained of its nature by professional men. In fact, that its true nature has not been explained by any medical writer from the time of Celsus, may be fairly inferred from the scanty share of notice bestowed on it in our latest systems of surgery. Mr. Benjamin Bell, though with every advantage of what preceding writers may have said on the subject, speaks in a very general and cursory way of the phagedænic ulcer, as little more than a high degree of *herpes exedens*. In his treatise on ulcers, speaking of *the Cutaneous Ulcer*, he says, "the *herpes exedens*, so called from its destroying

or corroding the parts which it attacks, at firſt generally appears in the form of ſeveral ſmall ulcerations, all collected into larger ſpots, of different ſizes, and of various figures, with always more or leſs of an eryſipelatous-like inflammation.—Theſe ulcerations diſcharge large quantities of a thin, ſharp, ſerous matter; which ſometimes forms into ſmall cruſts, that, in a ſhort time, fall off; but moſt frequently the diſcharge is ſo thin and acrid, as to ſpread along the neighbouring parts, and there to produce the ſame kind of ſores.

"Though theſe excoriations, or ulcers, do not, in general, proceed farther than the cutis vera, yet ſometimes the diſcharge *is ſo very penetrating and corroſive*, as to deſtroy the ſkin, cellular ſubſtance, and, on ſome occaſions, the *muſcles themſelves*. It is this ſpecies of the diſorder which ſhould properly be termed the *depaſcent*, or *phagedænic*, *ulcer*, from the great deſtruction of parts which it very frequently occaſions: but, by a piece of very great impropriety, ulcers of the herpetic kind have moſt commonly been conſidered as connected with ſcurvy, and have, therefore, by practitioners in general, been uſually diſtinguiſhed by the appellation of ſcorbutic."

It is not improbable, indeed, that the practice of employing quickſilver in the treatment of obſtinate ulcers, may have produced the phagedænic diſpoſition in parts not originally affected with it; for we have many proofs of its producing that ſpecies of miſchief, where it has been copiouſly employed during the ſuppuration of a bubo, &c. and thus it is, that ſurgeons may have entertained very confuſed notions of the nature of phagedæna, from the circumſtance of the change they may have remarked in ſome ulcers from a phagedænic character to ſome other, or *vice verſa*, according to the uſe or diſuſe of mercurial remedies employed with a view to affect the ſyſtem.

In his treatiſe on morbid poiſons, two diſtinct ſpecies of phagedæna have been deſcribed by Mr. Adams: one denominated "a ſloughing with ulceration, and each in ſucceſſion;" the other, ulceration, kept up by the irritation of the ſecreted pus. The firſt of theſe is the kind of ulceration we have already deſcribed, as occurring in hoſpitals to patients in a ſtate of debility, on whom extenſive operations have been performed. The conſtitution being prediſpoſed, and the morbid poiſon floating in the atmoſphere getting acceſs to their wounds, a moſt formidable phagedænic ulceration, of the ſpecies we are now deſcribing, ariſes, difficult to conquer, and frequently rendering neceſſary a repetition of the operation.

Phagedænic ulcerations upon the penis are ranked by Celſus among the cancers. Thus, in his ſection, "*Concerning the cure of a* CANCER *in the penis*," and that immediately following, "*Of the cure of the* PHAGEDÆNIC *ulcer in the penis*," he treats the ſubject in the following words:—"In what we have hitherto deſcribed,

there is ſtill no gangrene; to which, as in the other parts, ſo more eſpecially here, ulcers are liable. It begins with *a blackneſs*. If this ſeizes the prepuce, a probe muſt be immediately put under it, and an inciſion made; then the extremities are to be laid hold of with a vulſella, and whatever is corrupted muſt be cut away, and even ſome of the ſound part taken off, and the place cauterized. Whenever any part is burned, the next ſtep is to apply lentils; afterwards, when the ſloughs have caſt off, the cure is the ſame with that of common ulcers.

"But if a gangrene has ſeized the penis itſelf, ſome of the eſcharotic medicines muſt be ſprinkled upon it, chiefly that which is compoſed of lime, chalcites, and orpiment. If medicines fail of ſucceſs, here alſo whatever is corrupted is to be cut out with a knife, in ſuch a manner as that ſome of the ſound part be taken with it. This rule is as univerſal as the former, when a gangrened part is cut away, that the wound muſt be cauterized. But if, either by means of medicines, or the actual cautery, the ſloughs have grown callous, there is great danger, that when they caſt off, a profuſion of blood from the penis may follow; therefore long reſt is neceſſary, and keeping the body almoſt immoveable, till the ſloughs be gently looſened from it in proper time. But if a perſon, either wittingly, or inadvertently, by walking too ſoon, has ſeparated the ſloughs, and there enſues a hemorrhage, cold water muſt be applied. If that does not prevail, recourſe muſt be had to thoſe medicines which ſtop blood. If even theſe do not relieve, the part muſt be cauterized carefully and cautiouſly; and not afterwards expoſed to the ſame danger by any motion whatever."

What follows is yet more immediately applicable to the ſubject:—"Sometimes alſo, in the ſame place, there happens that kind of gangrene, which the Greeks call phagedæna; in which no time is to be loſt, but the ſame remedies muſt be immediately applied; and if theſe are not ſucceſsful, it muſt be burnt by the actual cautery. There is likewiſe a certain *blackneſs, which gives no pain, but ſpreads*, and, if we do not reſiſt it, makes its way to the bladder, and cannot be cured afterwards. But if it be at the end of the glans, near the urinary pipe, a ſmall probe ſhould be introduced into that firſt, to prevent its cloſing; and then the actual cautery muſt be applied to the ulcer. But if it has penetrated deep, whatever is tainted muſt be cut off. For the reſt, it muſt have the ſame treatment with other gangrenes."

Wiſeman, in book ii. chap. x. of his treatiſe, has the following remarks on this ſubject:—"*Phagedæna*," ſays he, "ſtrictly ſo called, is an ulcer with *ſwelled lips*, that eats the fleſh and neighbouring parts in the bottom and edges of the ulcer. It differs from the *herpes*, becauſe that *always begins in the ſkin*, with little moiſture: *this* always affects the *fleſh*, and abounds with matter.

"*Noma* is a deep ulcer, *that eats and ſpreads without tumor*, but hath a *rottenneſs and putrefaction* joined with it.

"Both theſe are venomous malignant ulcers, and both ſpread: but they differ, in that one hath *tumor, and no putrefaction*; and the other, *putrefaction, and no tumor.*"

Of the ſymptoms, he obſerves; "Some take their original from abſceſſes deep in the fleſh, others begin more ſhallow, and in time ſpread and eat not only the ſkin and fleſh, but the parts about, and diſſolve the fleſh in the bottom of the ulcer very ſenſibly."

Concerning the cure, after recommending local applications that are "cold and dry," in a ſenſe not intelligible to the modern ſurgeon, he adds, "If theſe anſwer not expectation, you muſt proceed with more ſtrong medicaments. But by the authority of the ancients, you muſt *ſcarify* theſe ulcers, or ſome way provoke them to bleed, that the *ſharp humours* may thereby be diſcharged. Then waſh them with ſome *drying* medicaments, which may alſo reſtrain the influx of the humours, as *aqua calcis*, *æruginoſa*, or *alumineſa*, &c. &c."

"But," continues he, "if this ulcer be with *rottenneſs and putrefaction*, you are to proceed with detergents, as *unguentum Ægyptiacum*, *mercurius præcipitatus*, *pulvis andronis muſæ*, alſo *cauſtic*, and *actual cautery*.

"To theſe applications, objections have been made; and, but a little above, medicaments are by myſelf propoſed, *drying without erroſion*: but when theſe take no place, we proceed to ſtronger; and where there is *putrefaction*, you will find uſe for the ſtrongeſt ſort of medicaments, as the *actual cautery*, it is not only ſerving to remove the *corroſive fleſh*, but to check the malignity, and ſtrengthen the weak part. But, in caſe that will not be admitted of, you muſt proceed with the other, and the while defend the parts about with *refrigerants*; and, after ſeparation of the corrupt fleſh, treat it by *ſarcotics*, and *epulotics*, as hath been elſewhere ſaid."

To theſe remarks, in which the author ſeems to have taken Celſus principally for his model, ſucceeds a detail of eight caſes, or "obſervations;" the two laſt of which ſeem to have been of the phagedænic kind, though he aſſumes the ſame of the reſt, from their being "difficult of cure."—His ſixth obſervation deſcribes the ſituation of "A gentleman of about fifty years of age, of a lean, *dry* habit of body, labouring under a corroſive ulcer, running from the left ſide of the upper lip near that noſtril, cloſe along the noſe, to the great *canthus*, or corner of the eye, penetrating the ſkin here and there *deeper than elſewhere*: it ſpread alſo *without the edges* of the ulcer, making, as it were, a double furrow along the ridge and ſide of the noſe, *ſuperficially in the ſkin*."

After reciting the external and internal remedies employed, he proceeds:—"By this method, I dried up the upper ulcer on the

ſide of the noſe, but the cicatrices were unſeemly, as in moſt ſuch rebellious ulcers they are; we being glad to dry them in any faſhion as we may.—The other ulcers alſo filled up with fleſh, and afterwards cicatrized in ſome parts. The deepeſt ulcers were alſo well-diſpoſed to it."—After ſome ſtay in the country, during which, the remedies were perſevered in, he returned with "the ulcer much exaſperated, and diſcharging a virulent matter, it having corroded deep the whole length from his upper lip along the cheek into the great canthus, dividing the lower lid of the eye, and was paſſing between the glandula lachrymalis and the eye: it had alſo ſpread beneath into that noſtril, and had paſſed its matter through; and, in truth, the caſe was moſt deplorable." "The topical remedies," he obſerves, "were only drying medicaments, without acrimony, which agreed well with the ulcer, but ſerved only to *palliate it*. The ulcer ſpread itſelf under that eye, fretting the muſcles ſo, that the eye was drawn by the contrary muſcles to the external canthus, and diſtorted ſo, as it was eaſy to ſee the optic nerve."—The author concludes the particulars of this miſerable caſe, by ſtating, that "The patient was attacked with the ſame diſeaſe on the other ſide, and, at laſt, fell a victim to its ravages." The other caſe, which ſeems to fall within the deſcription of phagedænic ulceration, is the following:

A gentleman of about forty years of age, of a ſanguine complection, and plethoric, had an *herpes excedens*, affecting the eyelids. It had been of ſome years growth. It began on the upper eyelid, near the *cilia*, or edge, in a ſmall puſtule, and ſpread along the edge to the external canthus, where it eat deeper into the ſkin, and by erroſion, cauſed an ulcer of a round figure, of the breadth of a ſilver penny, eating into that corner of the membrana conjunctiva, and thence the length of the lower eyelid, conſuming it downwards, leaving the *neighbouring parts ſchirrous*. Its erroſion in theſe parts was increaſed by the continual fluxion of the inflamed eye; for the upper lid where the herpes firſt aroſe, was not ſo much concerned, the original herpes lying there, not unlike a *hordeolum*. Purging, bleeding from the external jugular vein, and iſſues in the back, were tried, and "*frontals to intercept the deſcent of humours*;" but the event of this caſe, with ſome occaſional abatement and variation, was by no means unlike the former, for the patient, retiring into the country, with a ſupply of the remedies which had *apparently* rendered him ſervice, experienced, nevertheleſs, ſo great an increaſe of the malady, as to loſe the affected eye.

The term *cancer*, applied to this diſeaſe by Celſus, will not be thought difficult of conſtruction, when it is underſtood, that this is not the only inſtance of its miſapplication by the ſame writer, who includes eryſipelas, and other external ulcerations, which have an unlimited diſpoſition to extend themſelves, in the claſs of cancers.

The distinctions he has made of two species of phagedæna, we shall notice hereafter, in tracing Mr. Adams's remarks on that head.

Of the description of phagedæna given by Wiseman, in the preceding extracts, it may not be improper here to observe, that few who have attentively noticed the disease, will admit that it is "an ulcer with swelled lips." In this, however, and his description of *noma*, "which eats and spreads without tumor," and has "a *rottenness and putrefaction*" attending it, we trace the discriminations of Celsus very evidently.

Of the practice recommended by either of these writers, nothing need be said. The reader will, without difficulty, collect what is material from them; as well as observe what he finds discordant to modern notions respecting the treatment. The disease will, undoubtedly, be best understood by an attention to those well marked cases which stand upon record, and to which it will be sufficient if we refer. See, therefore, Mr. Hunter's Treatise on the Venereal Disease, part vii. page 385; Turner on the Venereal Disease, page 248; Edinburgh Medical Essays, vol. i.; and vol. iii. of the London Medical Transactions. These cases are pointed out to our observation by Mr. Adams. For his excellent observations on them, see Treat. Morb. Poisons, page 69, &c.

The distinction of phagedæna into two distinct species is clearly ascertained by Mr. Adams; who, remarking on the passages we have quoted from Celsus, and on the general opinions of that accurate writer, says, "What I particularly wish to remark here is his description and division of phagedæna into *two species*. The first is the common phagedæna, for which he advises the actual cautery. The other he describes as beginning with a *blackness*, or slough, and, if not prevented, spreading to the bladder *, in which stage no assistance can be given. If this is seated on the glans, near the urethra, he advises the same remedy, with proper care to preserve the orifice of the urethra; but if the disease has penetrated deep, that the knife should be used." The first species is by no means uncommon. Wiseman's cases are in point, as well as the instance related by Dr. Donald Monro, in the London Medical Transactions, but particularly the latter.

The other species of phagedæna, Mr. Adams contends, is only described by Celsus; and he follows up this remark by the recital (p. 70.) of a case at some length, which fell principally under his own management †. In this, the distinction quoted from that ve-

* See the foregoing extracts from Celsus.

† It may not be unnecessary to remark, that Mr. Adams grounds his distinction of the phagedænic from other ulcers, whose limits are more defined, on the circumstance of the "callous edge and base," which exist in the latter, being wanting in the former. To this he attributes the more rapid progress of phagedænic ulceration. See Treatise on Morbid Poisons, p. 96.

nerable writer, is very strongly marked, as Mr. Adams observes, in the following words; "The case," says he, "in its first stage, is exactly described by Celsus, as the phagedæna, distinguished by *quædam nigrities quæ non sentitur sed serpit.* It was, indeed, seated on the prepuce, and his directions are applicable to the glans, because his principal object in them is the preservation of the urethra. When phagedæna spreads in this manner, it is impossible to say how far the disease may have extended before the loss of substance shews itself. The propriety of the direction, therefore, to *cut beyond* the diseased part [*præcidendum*] in this instance, and to *cauterize* in the other, is easily comprehended."

It is greatly beyond our purpose to enter into Mr. Adam's reasoning on phagedæna of the last-mentioned species: neither would it be possible, within the limits we have necessarily prescribed to ourselves, to do sufficient justice to his ingenuity. Indeed, it is less our object to launch into the depths of hypothesis, than to make our work subservient to practical purposes; and, for this reason, we now proceed to consider what has been represented by practitioners as the most beneficial treatment of phagedæna in its different forms.

Here, however, we are under the necessity, not only of being concise, but, in a great measure, general; since, we know of no system of practice that has been found so uniformly beneficial as to be entitled to exclusive recommendation. There are two views of the subject, however, which it is necessary to take. One is of the constitutional, and the other of the local changes, which we should endeavour, by the use of medicine, to produce; and in this, both the species of phagedæna already spoken of are equally concerned.

In the phagedæna producing black sloughs, there can be no doubt but the bark, and, in most cases, opium should be resorted to; the former especially, in large and repeated doses, so that the constitution may be invigorated as quickly as possible, and enabled to resist the progress of the ulceration before it becomes so extensive as to destroy the patient. The internal exhibition of musk with volatile of ammonia, as described in our remarks on mortification, may also prove essentially useful. In all endeavours of this kind, the state of the pulse will afford a sufficient criterion: for the disease is, in fact, a species of mortification, differing chiefly from a common sphacelus in its disposition to affect parts not previously inflamed, and spreading rather superficially than to a great depth.

In the local treatment, antiseptic applications, such as the fermenting poultice, are of use; and so is a mixture of equal parts of Venice turpentine and the old compound tincture of myrrh, applied upon lint. Instances have occurred, in which a solution of opium, in the proportion of a drachm to a pint of water, has been of singular service. A specimen of the practice of the old surgeons appears in the treatment recommended by Wiseman, which, proceeding on the now exploded system of the humoral pathology, is

generally thought not deſerving of attention. In the phagedæna attended "with rottenneſs and putrefaction," by which is evidently meant that ſpecies which we are now conſidering, Wiſeman's inſtructions are, in ſome reſpects at leaſt, worth our remembering, however their ſeverity may deter us from adopting them. Theſe, as we have already remarked, relate to the application of *detergents*, as ung. Ægyptiac. merc. præcipit. &c. alſo *cauſtic*, and actual cautery.

If the experience of that writer afforded any ſanction to the uſe of ſuch means, eſpecially of the latter, it is to be ſuppoſed, the good effected by them muſt have ariſen from the new action brought on being ſufficient to counteract the diſeaſed action, and thus to arreſt the progreſs of the diſeaſe; and, indeed, where the conſequences are of ſo threatening a nature, there ſeems no reaſon why modern practitioners ſhould heſitate even to reſort to cauſtic and actual cautery.

Of the other ſpecies of phagedæna, the treatment is endleſs, in ſo far as even the moſt approved of our remedies barely eſcape the imputation of inefficacy. "As long as the conſtitution retains its ſuſceptibility, and the pus the property of the poiſon, the irritating cauſe will be conſtantly preſent, and ulceration or abſorption, with purulent diſcharge, will continue without interruption, and with ſuch rapidity often, as to prevent the formation of the adheſive lamina *, or to abſorb it as faſt as it is formed." What remedies then ſhall we reſort to in our attempts to counteract this kind of progreſs in the *true* phagedænic ulcer?

A remedy much too generally approved, and promiſcuouſly employed by practitioners, is mercury. For an inveſtigation into the phenomena which attend the uſe of that mineral, ſurgery is indebted to the author we have ſo frequently cited in this part of our ſubject. It has been already ſaid, that an injudicious perſeverance in the uſe of it has, eſpecially in the *crude ſtate* of a wound, in very many inſtances produced phagedæna. Notwithſtanding this, Mr. Adams concludes:

1. "That mercury is a remedy we are juſtified in trying in all caſes of ulceration that reſiſt common topical applications, and reſtorative remedies, particularly if unattended with ſlough.

2. "That where ulceration is *unattended with a callous edge and baſe*, mercury ſhould be exhibited with greater caution, and the *mercurial ſalts*, for the moſt part, preferred.

3. "That the *ſecondary ulcers* of ſome morbid poiſons yield to leſs mercury than their *primary* ones.

4. "That, in ſome inſtances, where mercury has been freely exhibited before the appearance of ſecondary ulcers, it has not pre-

* Mr. Hunter deſcribes the *adheſive lamina* as a proceſs which takes place in the formation of an abſcels, to prevent the effuſion of the matter.—Vide Adams on Morbid Poiſons, p. 92.

vented them. Yet, in these same cases, when secondary ulcers have appeared, they have yielded to a much slighter mercurial irritation than was ineffectually raised to prevent them.

5. "That blotches, or ulcers, which appear after the cure of secondary ulcers, seem, in the manner in which they yield to mercury, to bear the same analogy to secondary ulcers, as secondary ones do to primary.

6. "And lastly, that if a primary ulcer, whether of the sloughing or true phagedæna, should, at first, refuse to yield to mercury, we may be justifiable in attempting it a second time, with great caution, either when we conceive the disease kept up by habit, or so far familiarized to the constitution, that the novelty of the mercurial stimulus may be sufficient to excite a new action, however temporary *."

Of the "mercurial salts," there is no preparation so suitable in the treatment of phagedæna, as hydrargyrus muriatus, the effects of which are so far removed from those of quicksilver, in its simple forms, as to have induced Sir John Pringle to deny it the character of a specific in the venereal lues.

This circumstance renders it peculiarly eligible where we wish to produce, by internal remedies, a new action in any sore; but even this preparation is to be used, in the cases we are now speaking of, with the greatest circumspection. It should be exhibited in very small doses, and diffused in considerable draughts of some kind of fluid, as a decoction of sarsaparilla, guaiacum, mezereon, or cinchona. From an eighth to a quarter of a grain, repeated twice, or, at most, thrice, in the day, we should deem sufficient.

The use of this remedy is sometimes advantageously accompanied with the extracts of cicuta, hyoscamus, belladonna, &c. which, indeed, seem to be as useful co-operants as any that can be chosen. It frequently happens, however, that the mercurial salts are not merely ineffectual, but pernicious, and that the phagedænic disposition threatens to grow more considerable during their exhibition. The discontinuance of this plan then becomes a matter of course; and in lieu of the muriated quicksilver, it may be advisable to make trial of some of the vitriolated metals, more especially those of iron and zinc, as being less innoxious than copper, &c. and, of course, admitting of a more liberal and long-continued exhibition. The *ferrum ammoniacale* is also a remedy of great efficacy, and may be given to a very considerable extent†; yet we have found the *tinctura ferri muriati* to the full as effectual when the narcotic vegetable extracts have been given at the same time.

* It is not to be forgotten, that this ingenious writer's view of phagedæna has a principal reference to its occurrence in venereal cases; the general application of his conclusions is, however, very obvious. Chap. v. of the Treatise on Morbid Poisons, p. 99.

† M. J. Hamond gave it, in some cases of cancer, in the dose of two drams in a day.—Vide Surgical Tracts, 4to. p. 323.

Of *arſenic*, a remedy, it muſt be confeſſed, of conſiderable powers, but dangerous in its exhibition, in almoſt every form, we ſhall ſay little here at preſent; as ſome general remarks on it will be neceſſary when we come to ſpeak of the *cancerous ulcer*, for the treatment of which, it has been thought more particularly applicable. Internally we know of no preparation of arſenic ſo little dangerous as that with kali, uſed at St. Bartholomew's hoſpital; and externally, none is more ſerviceable than that with antimony (*arſenicum antimoniatum* of the Pharmacopœia Chirurgica), from a very ſlight application of which, occaſionally, a favourable change may be produced in the action of ſuperficial phagedænic ulcerations.

Some of the remedies uſed internally are alſo good as topical applications. The extracts of narcotic vegetables, eſpecially when combined with ſome of the neutral ſalts, as vitriolated magneſia, &c. or with borax, will now and then be found to anſwer a good purpoſe. Muriated quickſilver alſo, if diſſolved in a few drops of muriatic acid, and afterwards diluted ſufficiently with diſtilled water, ranks with the beſt of our topical remedies, not only in the ulcer of which we are treating, but in common ulcers, where a ſtimulus is wanting.

In the phagedænic ulcer, we often find that the ſame remedies will ſucceed beſt in the form of a poultice. Arſenic may ſometimes do more ſervice when applied after this manner, than in the way we have mentioned above. One grain being diſſolved in a quart of diſtilled water, and the ſolution carefully filtered, a cataplaſm may be made, by the addition of bread crumbs and linſeed meal. It is almoſt needleſs to add, that the application muſt be made to the bare ſurface of the ulcer, without any intervening dreſſing of lint, &c. which, however, ſome ſurgeons think ſhould never be omitted *. The arſenical poultice will, in all likelihood, give conſiderable pain, and require to be removed ſooner than any common application; but it will often change the action of the ſore, and, for a time, at leaſt, produce healthy appearances. Another beneficial kind of poultice, in ſimilar caſes, is the *cataplaſma effervescens* already ſpoken of. The carbonic acid, which is gradually extricated from it, and brought into contact with the ulcer, has, in various inſtances, proved of ſervice. A ſolution of common ſoap, formed into a cataplaſm, has alſo its merits; though, like any other remedy the practitioner may adopt, it is not equally uſeful in all caſes.

There are, beſides, a variety of topics, which may be uſed in the form of a powder, with ſome chance of advantage. Hydrargyrus nitratus ruber, prepared verdigriſe, and ſome of the narcotic vegetables, in a pulverized ſtate, are of this kind. Rhubarb,

* This, indeed, is to be regulated according to circumſtances; ſince, as has been obſerved in ſpeaking of common ulcers, different parts of a ſore will ſometimes require to be protected from the effects of any general application we may uſe.

columba, and ſquills, though more efficacious in promoting the healing of the common ulcers of long ſtanding, are alſo worthy of a trial; for where all is uncertainty, the remoteſt hope even ſhould be encouraged.

It is to be obſerved, that in the application of remedies ſo oppoſite in their apparent tendency, there is great room for the exerciſe of the ſurgeon's judgment and diſcretion. To thoſe phagedænic ulcers, which affect the ſurface chiefly, "ulceration going on in the ſurrounding ſkin, while a new ſkin forms in the centre, and keeps pace with the ulceration, exhibiting an irregular ſore, like a worm-eaten groove, all round," thoſe ſtimulating topics, which tend to alter the action of parts, may be uſed with leſs reſerve; while, on the other hand, the treatment of thoſe caſes in which the ulceration is diſpoſed to penetrate, and where a great degree of inflammation, pain, and irritation, ſubſiſt, muſt, of courſe, be managed with greater delicacy. Notwithſtanding this, it is to be obſerved, that the exiſtence of pain and irritation, which frequently ſeem to be aggravated by mild, relaxing, and more particularly greaſy applications, is no reaſon why ſharp remedies ſhould not be made choice of; but rather the contrary, ſince in overpowering the diſeaſed action, which may have become habitual in the ulcer, we often exerciſe the only means of effecting a cure.

In the phagedænic actions, which, in many caſes, ſucceed thoſe of the venereal poiſon, or rather of the poiſon of the mercury, almoſt all the remedies we have named have been occaſionally tried. Mr. Hunter, indeed, ſpeaks very fully of them in his treatiſe on the venereal diſeaſe, and intimates, among other means of treating buboes which have become phagedænic, a practice uſual at the Lock hoſpital, of applying gold-refiner's water to them.—He alſo mentions the mezereon as a uſeful medicine, in ſome inſtances, and the copious internal exhibition of the juice of oranges, as recommended by Dr. Fordyce.

Thoſe, indeed, who read with attention that invaluable work in which theſe hints appear, will anticipate much of the information we have been able to convey, as to the remedies poſſeſſing a greater or leſs ſhare of conſequence in the treatment of phagedæna.—For this reaſon, we ſhall not extend this part of our ſubject farther than to remark, that the greateſt uncertainty exiſts as to the effects even of the moſt reputed of our remedies; and that a patient and perſevering trial of each in ſucceſſion, will often be neceſſary, before any will be attended with the ſalutary conſequences for which we are anxious.

Sect. XI. *Of the* Cancerous Ulcer.

That kind of ulcer which authors have chosen to distinguish by the appellation of *cancerous*, is a disease very different from that to which the term properly belongs. It is supposed to arise from some existing virus in the constitution, to attack the skin more commonly than any of the deeper seated parts, and to appear in the face more frequently than in any other part of the body. Those who have attempted a description of this ulcer, as distinct from the true cancer, have certainly been misled by the anomalous character which most unmanageable ulcers are apt to assume; and have only used the term *cancerous*, because none more appropriate seemed to present itself; for certainly that disease, which they describe as cancer, can have no pretensions to the name, were it only from the mere circumstance of its being, in many instances, *curable*.

This kind of ulcer "is a malignant, corroding sore, upon the skin, the surface of which is glossy and shining, and furnishes an offensive and ichorous discharge. It partakes of some of the shooting, lancinating, darting pain of the cancer; though not nearly in so great a degree. But the great *distinction* between that and the *true cancer* is, that its *edges* are not *indurated* and *tucked in*, or *inverted*, as those of the true cancer. The true cancer cannot be cured without extirpation; the *cancerous ulcer* very frequently admits of a cure. The latter, now and then, makes its appearance after the venereal chancre, for the corrosive, creeping, and malignant ulcer, that comes on after this complaint, is of that kind."

In these terms has one of the most eminent of the public teachers of the practice of surgery spoken of what has been usually called the cancerous ulcer; but though, in his description of it, there is no deviation from what may be supposed the received opinions on the subject, it is by no means difficult to perceive, that this kind of ulcer has not the remotest alliance to cancer, and certainly has therefore been improperly hitherto considered as a species of carcinoma. Although the pain is described as *lancinating*, like that of cancer, yet two of the strongest characters of the latter disease are wanting, namely, the incurvated, or expanded state of the edges, and the *uniformly fatal* event.

But if any thing farther were necessary to shew the erroneous grounds on which an ulcer that is not a cancer is termed cancerous, it would be found in the concluding lines of the foregoing description, where that species of ulcer which arises from the action of a morbid poison on the penis, and which we have already spoken of in the section on phagedænic ulcer, is confounded with cancer. After stating these reasons, we shall not be expected to accede to a distinction in itself so clearly fallacious; but rather to apply our-

ſelves to the conſideration of the true cancer in its ulcerated ſtate; not, it muſt be confeſſed, with the vain hope of wholly *preventing* its *ultimate conſequences*; but, at leaſt, with a view of retarding its progreſs, alleviating its violence, and contributing to render ſomewhat leſs irkſome the lives of thoſe who are unfortunately the ſuffering victims of this dreadful malady.

By the term *cancerous ulcer*, then, we mean a cancer in its advanced ſtage, when the diſeaſe ceaſes to be what is called *occult*.

The following definition is given by Mr. Pearſon, who ſays, "A *cancerous ulcer* is attended with a conſtant ſenſe of ardent pain: it is irregular in its figure, and commonly preſents an unequal ſurface; it diſcharges a ſordid, ſanious, and fetid matter: the edges of the ſore are thick, indurated, and often exquiſitely painful; they are ſometimes inverted, at other times retorted, and often exhibit a ſerrated appearance. The ulcer, in its progreſs, is frequently attended with hæmorrhages, in conſequence of the eroſion of blood veſſels."

Of the progreſſive ſteps by which this cruel diſeaſe advances to that ſtate, we ſhall here ſay a few words by way of introduction. When this diſeaſe takes place in glandular parts, and particularly in the breaſts of women, a number of hard chords are found to extend themſelves in different directions from the principal tumor. To this circumſtance, which preſents to the imagination the idea of a reſemblance to a *crab*, is owing the name by which the earlieſt writers have diſtinguiſhed a complaint, for which, indeed, nothing more appropriate can be deviſed ſo long as we remain, as at preſent, ſo entirely in the dark reſpecting its true nature.

As theſe hard chords, which are nothing more than inflamed and hardened abſorbent veſſels diverging from the principal tumor, were obſerved by the ancients to occur in other ulcerations than thoſe to which, in our days, the term cancerous is confined, it became common with them to conſider as cancers various complaints, which, in the more improved ſtate of ſurgery among the moderns, were afterwards placed in a very different claſs.

When a hard tumor, which has exiſted a long time in the breaſt, without either diminiſhing or increaſing, and without giving any pain, begins at length to grow uneaſy, to extend gradually in its dimenſions, and to be affected with occaſional pungent and *lancinating* pains, there is reaſon to ſuſpect that it is taking on the cancerous action. This is not, however, invariably the caſe; ſince many inſtances have occurred, where the tumor has fallen into a ſtate of inflammation, and even been attended with that peculiar kind of pain which moſt of all is to be ſuſpected, and yet the diſeaſe has not proved to be of that fatal nature, but the patient has received a certain, though tedious cure. Theſe inſtances, when they do occur, are eagerly laid hold of by quacks and the venders of noſtrums; and are advertiſed as inſtances of the efficacy of their

plans, which unwary perſons, really affected with cancer, are ſometimes drawn in to make trial of, at the expence, perhaps of the only reſource which remains for their ſecurity.

The lips, the tongue, the face, the penis, and teſticles, are the moſt common ſituations of cancer in men: in women, it is uſuall confined to the breaſts, the uterus, and the rectum; though, in either ſex, any of the ſoft parts may be attacked by it.

The diſeaſe does not put on the ſame appearance in every inſtance, but, in common with ſome other local affections, is ſo far influenced by the peculiarity of ſtructure of the part affected, as to exhibit very diſtinct appearances. Theſe, indeed, have borne ſo little reſemblance in ſome inſtances, as to have tempted practitioners to deny that the general term cancer could be ſtrictly applied to them. Mr. Adams thinks the *cancer of the uterus*, at leaſt, a very fair exception; and not only that of the rectum, but every carcinomatous affection which begins on the ſkin, or parts ſuperficially ſituated, ſeems clearly diſtinct from the ſame diſeaſe in the breaſts or other ſecreting glands.

A preceding or preparatory ſtage of this diſeaſe authors have diſtinguiſhed by the name of *ſchirrus*. The ſchirrous ſtate of a gland is that in which the tumor gives no uneaſineſs, and in which the ſkin does not loſe its natural colour. Every indurated and inſenſible tumor in a gland is, therefore, ſtrictly ſpeaking, a ſchirrus: the term, however, is never applied to ſuch affections, unleſs they threaten to terminate in cancer, as will be obſerved when we come to ſpeak more circumſtantially of the latter.

When a ſchirrous tumor has advanced to a cancerous ſtate, the hardened ſubſtance takes on ſome degree of irregularity; and not only becomes more or leſs attached to the part on which it grows, but advances, in a certain degree, towards the ſkin, which participates in the diſeaſe, and forms a kind of tucking in, or fiſſure. At this part the alteration commonly begins, which gives the diſeaſe the name of an *open* (in oppoſition to the term *occult*) cancer; and from this breaking kind of ſtate, it gradually proceeds to ſuch a proceſs of ulceration, and conſequent diſcharge of matter, as calls for the daily renewal of ſome kind of external dreſſing. Some would call this an *ulcerated cancer* rather than a *cancerous ulcer*; but we know of no ulcer but that which in other words might be called an open cancer, to which the epithet *cancerous* can be ſtrictly applied.

Indeed, it is not uncommon with practitioners who have had few opportunities of marking the progreſſive ſteps by which the cancerous ulcer is eſtabliſhed, to conſider as ſuch other ulcers (particularly of glandular parts), which have a ſtrong degree of malignity in themſelves, and alſo reſemble cancer in their ſpontaneous beginning, their ſlow progreſs, and the kind of pain they have been attended with. Hence we ſee the importance, not only of obtaining from the patient an accurate and circumſtantial hiſtory of the

complaint, but alſo of being able to diſtinguiſh which of the ſymptoms are, and which are not, fairly referrible to cauſes of a cancerous nature.

It is not in every caſe however, that the progreſs of a cancerous affection is ſlow; for although, in the generality of inſtances, a period of ſome years elapſes before it paſſes through its preparatory ſtages, in ſome habits the diſeaſe becomes complete even in the courſe of a few months. In ſuch caſes, there are ſucceſſive and violent attacks of local inflammation, and the conſtitution alſo ſuffers by a correſponding degree of fever; each apparently acting in ſucceſſion as cauſe and effect: for it is by no means uncommon to find the fever preceding the renewal of the local inflammation. That the ſyſtem is very materially concerned in cancerous affections, is evident from the looſe texture of the blood which has been found to prevail in perſons prediſpoſed to it. On this principle, perhaps, we may account for the diſpoſition to hemorrhage ſo prevalent in the open ſtate of cancerous ulcer, and likewiſe for the extraordinary acrimony, corroſiveneſs, and peculiar fetor of the diſcharge.

The late Dr. Adair Crawford, in the Philoſophical Tranſactions, vol. lxxx. page 391, has given an account of ſome experiments, made with a view to detect, by *chemical agency*, the nature of cancerous virus; and we ſhall here conciſely mention their reſult. It is alleged,

1. "That the appearance of a powerful *volatile alkali* is detected in the diſcharge.

2. "That with this alkali, there is united an *aërial fluid*, poſſeſſing the chief properties of *hepatic air*.

3. "That by the combination of theſe principles, a ſort of *hepatiſed ammonia* is formed, on which the *deleterious nature* of the matter depends." A "peculiar offenſive fetor" in the diſcharge; "the ſwelling of the contiguous lymphatic glands;" and, laſtly, "the corroſion of veſſels;" are indications of the exiſtence of the real cancerous poiſon; and ſo great are its powers of corroding, that they act not only on the animal fibre, but even on metals. The celebrated Van Swieten alleges, that he has ſeen the texture of linen rags as completely deſtroyed by it as if they had been moiſtened with nitrous acid; it is not very uſual, however, to witneſs theſe effects in common caſes.

The experiments of Dr. Crawford on this intereſting ſubject, naturally led him to ſome conjectures as to the remedy moſt likely to counteract the cancerous virus. Of this we ſhall conciſely take notice in the courſe of what we have to obſerve on the treatment.

As the diſeaſe, when arrived at the ulcerous ſtate here deſcribed, can only be ſucceſsfully combated through the medium of the conſtitution; and as none of the many remedies propoſed have, on trial, been found to merit our confidence, it would be a waſte of

time even to enumerate them; we ſhall, therefore, dwell principally on the local treatment, from which we may hope to procure for the patient ſome temporary advantages at leaſt.

Our object, then, will be—1ſt, To alleviate the violence of the pain: 2dly, To amend the diſcharge, or, at leaſt, correct its fetor: 3dly, To retard the extenſion of the ulcer: 4thly, To reſtrain occaſional hemorrhages, and prevent their debilitating the ſyſtem.

1. The remedies capable of alleviating the violence *of the pain*, are both internal and local. Of the former, not only opium, but moſt of the inferior narcotics, have been variouſly adminiſtered with conſiderable temporary effect. It is expedient, indeed, at almoſt all events, to carry the uſe of theſe remedies as far as the immediate ſafety of the patient will admit: not forgetting, that, in the alleviation of pain, is, perhaps, involved the prolongation of life; for debility, the gradual increaſe of which marks the progreſs of cancer to its fatal termination, is greatly increaſed by long-continued and violent pain.

It is to this property alone in the different narcotic vegetables, that many practitioners attribute their ſuppoſed virtue in cancerous diſeaſes. Pain not only abſtractly, but relatively, impairs the body. Its ſtimulus is not merely attended with direct morbid conſequences, but tends alſo indirectly to the patient's injury, by deſtroying the appetite, and producing the moſt afflicting ſtate of mental dejection.

The narcotic vegetables, excluſive of opium, are *cicuta*, *aconitum*, *hyoſciamus*, and *belladonna*. On the medicinal properties of hemlock, a great diverſity of opinions have been maintained; and for this there is a mode of accounting, of which few, perhaps, are aware. According to ſome writers, but more particularly Dr. Withering, *there are ſeveral ways in which the views of a medical practitioner*, in preſcribing hemlock, *may be fruſtrated*. The plant choſen for preparing the extract may not be the true *conium maculatum*, which is diſtinguiſhed by red ſpots along the ſtalk. It may not be gathered when in perfection, namely, when beginning to flower. The inſpiſſation of the juice may not have been performed in a water-bath, but, for the ſake of diſpatch, over a common fire. The leaves, of which the powder is made, may not have been cautiouſly dried, and preſerved in a well-ſtopped bottle; or if ſo, may ſtill not have been guarded from the ill effects of expoſure to the light. Or, laſtly, the whole medicine may have ſuffered from the mere effects of long keeping. From any of theſe cauſes, it is evident, the powers of cicuta may have ſuffered; and it happens, no doubt, very frequently, that the failure of it ought, in fact, to be attributed to one or other of them.

To the foregoing liſt a late writer has added the diſtilled water of *lauro-ceraſus*, and *nux vomica*. He has, however, done little more than name theſe remedies. The former, it ſeems, was tried without

ſucceſs by Profeſſor Richter, of Gottingen. Yet whilſt the effects of it on the human body remain unaſcertained, a farther trial, it is to be hoped, will be made of it, not only in this, but other diſeaſes, for which, at preſent, no means of cure are known.

One or other of theſe remedies, accurately prepared, may be adminiſtered, from ſmall beginnings to a doſe ſufficiently conſiderable to blunt the feelings of the patient, and render the pain of a cancerous ulcer very trifling. In ſome, perhaps, a beneficial change may be produced in the ulcer itſelf; though we are not to be too ſanguine in our expectation of this.

The external remedies to be had recourſe to in theſe unfortunate caſes, are much more various. They conſiſt, chiefly, of two deſcriptions, to wit, the emollient, and the ſedative; and their modes of application admit likewiſe of being conſiderably varied. Beſides employing ſtrong infuſions of the narcotic vegetables already mentioned, either in the form of fomentation and poultice, or by pledgets of lint dipped into them, we may add to the liſt an infuſion of tobacco, a plant poſſeſſing, perhaps, the moſt powerful ſedative virtues of any that have been named. Emollient remedies that are ſimply ſuch, are leſs worthy of our choice than thoſe laſt mentioned, which anſwer both intentions.

Where the uſe of fomentations and poultices happens to be ineligible, great eaſe may be procured by ſprinkling the ulcer copiouſly with a fine powder of the leaves of cicuta. Sometimes the farina of malt alone will have a good effect; and the uſe of remedies in this particular form has this great advantage, that they abſorb the acrimonious diſcharge, and thereby prevent much pain, which, from that cauſe alone, would be felt by the patient.

On ſome occaſions, it has been ſaid, a ſolution of aſſa-fœtida has been found not only to give eaſe, but to benefit the ulcer. The ſame may be ſaid of cold-drawn linſeed oil, alone, or with a ſmall portion of camphor diſſolved in it. Other practitioners have recourſe to thick ſolutions of the narcotic extracts; joining with them a due proportion of ſal-ſedativum. Where any of theſe are tried, the mode of application is by pledgets of lint dipped into the mixture, and renewed according to circumſtances.

But a remedy capable of affording much relief, not only in this, but almoſt in every view, is the application of a bliſter at ſome little diſtance from the ulcer. Where the pain occurs in a violent degree, it is generally brought on by ſome freſh attack of inflammation, and the bliſter, by exciting a powerful ſtimulus in its neighbourhood, will frequently have the effect, common to the ſame remedy in other caſes, of drawing off inflammation, and conſequently leſſening the pain in the ulcer.

2. Of remedies which are calculated *to amend* the diſcharge, and correct *its fetor*, the number, correctly ſpeaking, is very limited.

They all conſiſt of ſubſtances poſſeſſing antiſeptic qualities; ſuch as poultices prepared of turnips, carrots, &c. boiled and maſhed; the effervefcing cataplaſm; or, what is beſt of all, *carbonic acid* vapour (fixed air), applied by an apparatus ſimilar to that lately recommended by Dr. Ewart, and deſcribed in his account of cancerous caſes treated at Bath.

The bruiſed leaves of freſh hemlock are alſo ſerviceable in this view; as is, likewiſe, the ſolution of camphor in linſeed oil, mentioned above. Some have tried decoctions of aſtringent vegetables, particularly cinchona.

It is here proper to mention the chemical preparation that Dr. Crawford conceived moſt likely to deſtroy the cancerous virus, which he had found to conſiſt in an *hepatiſed ammonia*.

His hopes were chiefly founded on the *oxygenated muriatic acid*, diluted with thrice its weight of water, which, by this dilution, gives little pain to caſes that are not highly irritable. In ſome inſtances, he found that it *corrected the fetor*, and *amended the diſcharge*; but its good effects were by no means uniform, for it failed entirely in many others. Its operation is ſtill, therefore, a matter of equal uncertainty with moſt other applications in this diſeaſe. How far this acid is to be ventured on internally is to be doubted; and alſo, if uſed internally, whether it would produce any ſtronger effect than any other ſimple acid.

Though objections may exiſt to the internal uſe of oxygenated muriatic acid, it may, nevertheleſs, as an external application, anſwer the end of correcting the fetor, which is extremely offenſive to the patient, and even injurious; ſince the effluvia entering the lungs along with the atmoſpheric air, greatly injures the purity of the latter.

3. To *retard the extenſion of the ulcer*, is, perhaps, a taſk of little leſs difficulty than to effect its diminution; and muſt conſiſt in an union of the means which we propoſe to point out as requiſite to the ſeveral indications. To retard the progreſs of a diſeaſe, we muſt adopt all the methods that have a tendency towards its cure; and, therefore, in the inſtance before us, we are called upon to employ not only external, but internal remedies, and alſo to attend to diet, exerciſe, and every circumſtance by which vigour may be imparted to the conſtitution, and the general health of the body maintained.

Of the internal remedies moſt beneficial to a cancerous ulcer, and which have not been already taken in another view, there remain only two to which the ſmalleſt efficacy can be juſtly attributed; and, unhappily, we are almoſt wholly precluded from the uſe of one of them, by the danger which invariably attends its exhibition. The two remedies we ſpeak of are arſenic and iron. Of the effects of the former we have very copious accounts in the writings of the late Mr. Juſtamond, and many others. Theſe are ſufficient almoſt

to prohibit the uſe of arſenic entirely in *any* caſe; yet as ſome may be of a different opinion, there are fewer objections to that preparation of it, uſed at St. Bartholomew's Hoſpital, under the name of *kali arſenicatum*, than to any other with which we are acquainted.

With regard to the uſe of iron, it may truly be ſaid, that it has a very conſiderable effect in ſupporting the ſyſtem, and leſſening debility; and it will even produce very flattering appearances in ſome cancerous ſores, more eſpecially thoſe of the face. The author laſt quoted has detailed very much at length the reſult of his trials of that preparation, called *ferrum ammonicale*: it is, of courſe, ſuperfluous to enter upon the ſubject here; yet it is neceſſary, perhaps, to mention his having alſo employed a ſpirituous preparation of the ſame metal as a *topic*, and, in many caſes, with the evident effect of *retarding the extenſion of the cancerous ulcer*.

This preparation, made according to a German recipe, was unneceſſarily elaborate; and, except in point of cleanlineſs of application, poſſeſſed no advantage over the *tinctura ferri muriati*, which Mr. Juſtamond afterwards employed as a ſubſtitute. This tincture is recommended to be applied with a camel's-hair bruſh upon the thick curling edges of the ſore, and to ſome little diſtance around it; dreſſing the ulcer itſelf with any other remedy that the ſtate of it might ſeem to require.

Among the means of retarding the progreſs of the ulcer, we may alſo very properly reckon the occaſional application of bliſters, in the manner already mentioned; and alſo the uſe of the *arſenical cauſtic*, from time to time, to ſuch parts of the ulcer, or of its edges, as are particularly ill-conditioned.

It muſt be admitted, indeed, that the uſe of active cauſtics, as a means of *retarding a cancerous ulcer*, ſhould be adopted with great circumſpection. Whatever creates active inflammation, ſpreads the cancerous poiſon in an equal proportion; and unleſs we can qualify our applications in ſuch a way as to deſtroy *without inflaming* (which cannot but be a difficult, if not an impoſſible taſk), we ſhall run ſome riſque, not only of adding to the patient's preſent ſufferings, but alſo of ſpreading the miſchief to parts not before affected by the diſeaſe.

In many common ulcers, however, and ſometimes in the cancerous ulcer, there exiſt parts which, poſſeſſing leſs of life than the ſurrounding ſubſtance, may be deſtroyed by a prudent management of the cauſtic, without producing much irritation. There is ſome difficulty too in the applications we may ſelect for this purpoſe; yet we have the means of qualifying them by the mixture of other ſubſtances capable of adding to that diſpoſition, in certain parts of the ulcer, which we have deſcribed as favourable to the inſenſible operation of a cauſtic. Theſe ſubſtances are not merely ſuch as weaken its powers in proportion as they extend its bulk, but ſuch

as act specifically on the animal fibre, and by diminishing its life yet more considerably than before, render it a prey to the escarotic properties of the composition, with only a slight degree of inconvenience to the patient.

The caustic most advisable in this view, therefore, is a mixture of due proportions of antimoniated arsenic, opium, and camphor, the proportions being regulated according to the degree of irritability and sensibility existing in the part destined for its action. The additions to the caustic should, at least, be equal to two-thirds of the bulk of the whole; and the proportion of opium should be about double that of the camphor: but all these circumstances must be matter of discretion with the practitioner, as must also the extent of surface to be attacked, the intervals to be allowed between each successive application of the caustic, &c.

We shall not close this part of our subject without remarking, that, among the remedies which have been suggested for the improvement of cancerous ulcers, Dr. Saunders has mentioned the internal use of the juice of the well-known plant, called *goose-grass*. Perhaps, this is not unworthy of a trial. It should, however, be given to some extent, and continued for a considerable time, before any favourable effects are to be expected.

4. The last object of our enquiry is after the means of *restraining hemorrhages* from the cancerous ulcer; and this may be included in a very few remarks. When a cancerous ulcer is greatly advanced, and the matter it discharges is highly corrosive, the ulceration is not confined to the muscular fibres of the part, but preys also upon the blood-vessels, and every other substance in its way.

In cancers, as well as in most other local diseases in which an unusual quantity of blood is derived to the part, both the arteries and veins become considerably enlarged. Even the veins, when their coats are corroded, will give vent to considerable quantities of blood; but when a branch of an artery is partially destroyed, the hemorrhage becomes far more serious; and it very often happens, that a repetition of bleeding from this cause, joined to the pre-existing constitutional debility, carries off the patient. Nor need we wonder at this: the artery thus affected, being buried in a diseased mass, cannot be secured by an operation, as in common cases; while, on the other hand, its being *partially*, not wholly, divided, prevents the usual natural cure of hemorrhage from small arteries, by spontaneous contraction. Its situation admits not of pressure, which, indeed, the indurated state of the surrounding parts would tend greatly to defeat, even if a bandage and compress could be applied. Our chief resource then, though a poor one, is the application of *styptics*: but the patient's life is at stake, and we must attempt *something*.

In applying styptics, we are to consider that the most powerful are, in general, such as give considerable pain, and excite, what to the

utmoſt we ſhould avoid, inflammation. Of this deſcription we may inſtance the vitriolated metals, particularly copper, ſpirit of turpentine, alum, and many others included in our diſpenſatories. Some are of a milder deſcription, but, unhappily, their efficacy diminiſhes in proportion as they are leſs ſtimulating. It is right that we ſhould try the latter, however, and recur to the former only in caſes where the hemorrhage demands a leſſer inconvenience, as the price of avoiding a conſiderable evil.

Some very profuſe bleedings, it appears, have been reſtrained by the application of pounded ice to the part; but in thoſe which call for the uſe of a deciſive remedy, the application of a little of the arſenical cauſtic to the bleeding veſſel, is a ſtep which may very properly be taken, ſince, by the total obliteration of the veſſel (which before was only partially opened by the corroſion of the diſcharge), a ſtop may be put to the bleeding for the preſent, and a ſubſequent ſeparation of the eſchar may prevent any future return of it.

We cannot, however, quit this ſubject without mentioning an empirical preparation, which, though deſtitute not only of irritating qualities, but even of aſtringency to the taſte, acts, nevertheleſs, as a moſt powerful *ſtyptic*. We mean the liquid diſcovered by Mr. Ruſpini. Its effects in other inſtances demonſtrate, that, as a means of reſtraining hemorrhage from cancerous ulcers, it is worthy of being applied, particularly as it can have no detrimental effect on the part, as the other remedies of this claſs have, in a greater or leſs degree, in almoſt every inſtance.

SECT. XII. *Of* ULCERS *ariſing from* CONTAGION.

That ulcers of this deſcription really exiſt, we muſt take for granted, on the evidence of reſpectable profeſſional gentlemen, who have ſeen them. We ſuſpect, however, that they are nearly allied, at leaſt, to the *ſloughing phagedæna* common in hoſpitals, and of which we have already ſpoken. The accounts of this unuſual ulcer that have lately attracted our notice, are thoſe publiſhed in the Medical and Phyſical Journal, by Mr. Ballard and Mr. Henderſon, ſurgeons in the navy, Mr. Edwards, of Haſſar hoſpital, and others, whoſe deſcriptions we ſhall give in their own words.

"I entered into the navy," ſays the former of theſe gentlemen, "in March, 1798, with an appointment to his Majeſty's ſhip Triumph, then commanded by Capt. William Eſſington. On entering on my profeſſional duty, I was ſtruck with *the appearance of the ulcers*, which had been for ſome time under the care of my predeceſſor. They were very different from the appearance of any ulcers I had ever ſeen before, either in private practice, or during my attend-

ance at the General Hoſpital, near Birmingham. I was, therefore, reſolved to pay very peculiar attention to them, and obſerve their progreſs, for I really predicted in my own mind, that we ſhould have ſome trouble in the management of them. I collected what information I could reſpecting them from my profeſſional friends on board, and was informed, that a man with a very ill-conditioned ulcer had been received on board the Triumph from the guard-ſhip at Spithead, and from the date of his introduction into the ſhip, they had obſerved ſome alteration in the complexion of the ſores; but it did not ſeem to be ſo apparent to them as to me, who had ſo lately come from the ſhore: I did not, however, loſe ſight of my own opinion: it is true, two or three caſes healed firmly, but notwithſtanding, we could eaſily perceive, that every ſucceſſive caſe became more and more inveterate. The Triumph ſailed with Lord Bridport on the 12th of April, 1798, with ſeveral bad caſes of ulcers in the liſt of ſick. We returned to Torbay about a month afterwards, with a conſiderable increaſe of theſe caſes; in ſhort, the ſituation appropriated for the reception of the ſick on board of a ſhip, was completely filled. Dr. Trotter, the phyſician to the fleet, was applied to, and ſome of the worſt caſes were ſent on ſhore; ſtill, too many were retained. We did not remain long at Torbay; and the Triumph's next cruiſe was not leſs than three months, during which time we were ſadly haraſſed with increaſing numbers of theſe deſperate caſes. Mr. Thomas Moffatt, the judicious ſurgeon of the Triumph, uſed every exertion to overcome this deſtructive complaint, and every external means that afforded even a gleam of hope was tried; the fumes of nitric acid were uſed three weeks with unremitting attention, but without any permanent advantage reſulting, and it was relinquiſhed on that account. The Triumph returned to Plymouth with a great number of theſe ulcers, and the greater part of them was ſent to the Naval Hoſpital there.

"To a cruiſe on the coaſt of Ireland theſe baneful attendants followed us, now accompanied with alarming fever, which did not appear before, requiring the moſt active remedies of inflammation, which generally terminated it in three or four days, leaving the patient exceſſively reduced. Opium was then uſed with great advantage, by ſuſpending the irritation occaſioned by the continual abſorption of putreſcent particles into the ſyſtem. I am indebted to a very reſpectable phyſician in Birmingham, for an idea reſpecting the nature of the fever and inflammation attending theſe caſes. He calls the fever a ſpecies of typhus, and the inflammation a ſpecies of eryſipelas, which accord perfectly with my ideas."

Amongſt the motives aſſigned by the author for giving this looſe kind of ſtatement to the public, is that of having, ſince his return from the Weſt Indies, been informed, by a very reſpectable practitioner in the navy, that theſe ulcers ſtill make their appearance; "and having," ſays he, "myſelf been an actual obſerver of their

deſtructive effects, I cannot, in conſcience, withhold what I think the only means of eradicating them from the navy. The practitioner above alluded to, has told me, that his ſhip was free from any ſuch caſes, 'till the introduction of ſome bad ones from a ſhip in the Channel ſervice, and in vain did he endeavour to eradicate them by external remedies. Thus circumſtanced, he reſolved to ſend every caſe, however ſlight, out of the ſhip, and totally deſtroy every thing that had been uſed in dreſſing them,' viz. ſponge, lint, &c.; and it appears, that this practice was attended with the happieſt effect: I have the teſtimony of himſelf, and my own actual obſervation, that he has not, at preſent, one ſolitary caſe of bad ulcer under his care. From theſe evidences, I moſt ſincerely recommend a ſimilar mode of proceeding in every ſhip in his Majeſty's ſervice, in which theſe caſes exiſt, for I am convinced that no other *means will be effectual in baniſhing them from the navy.*"

The following obſervations on ulcers, by Mr. Stewart Henderſon, are very much to our preſent purpoſe. "Of ulcers, and the nature of the ulcerative proceſs," he obſerves, "much has been ſaid of late by eminent medical characters. It is only my intention here to take notice of *that ulcer to which ſeamen and ſoldiers are more particularly ſubject*, from the nature and manner of their life. Next to fever and dyſentery, this complaint proves the moſt deſtructive to Britiſh ſeamen and ſoldiers, and no ſurgical diſorder has deprived his Majeſty's ſervice of ſo many men, as every experienced ſurgeon muſt have obſerved, who has attended our hoſpitals during war; nor are there any caſes more unfit for general hoſpitals on their preſent principle.

"When I acted as ſurgeon to his Majeſty's naval hoſpital at Antigua, in 1780, nearly one-third of the patients laboured under this complaint. Being at that time a young ſurgeon, I was unwilling to run the riſk of deviating from eſtabliſhed authorities, and therefore purſued the plan pointed out by men of high repute in the profeſſion. Our method of treatment then conſiſted of poultices, various ointments, and other relaxing applications, with a ſparing uſe of tonics and ſtimulants; reſt and confinement being ſtrictly enjoined. I could not help lamenting the inefficacy of thoſe remedies, when I ſaw ſo many fall victims to the diſeaſe, and others loſe their limbs, being obliged to undergo a painful and hazardous operation. Baffled in every attempt to heal theſe ulcers, I was under the neceſſity of having recourſe to an operation, as the only chance of ſaving life.

"Dr. Young, phyſician to the hoſpital, Mr. Weir, ſurgeon of the Alcmena, now phyſician to Lord St. Vincent's fleet, agreed with me in the neceſſity and propriety of performing this operation. We conſidered that it was only aſſiſting Nature, for ſhe was endeavouring to get rid of a part which had become uſeleſs, and was contaminating the whole ſyſtem. I was further encouraged by the anxiety of

the patients to have it done; and what gave me greater reaſon to expect ſucceſs, was, that in a row of empty rooms appropriated for officers, I had the liberty of putting the men before the operation, where they would breathe pure wholeſome air, which they had long been ſtrangers to in the hoſpital. Fourteen underwent the operation, moſt of them below the knee, which I always prefer when the caſe will admit of it. Such was the advantage of their being removed from the noxious air of a crowded ward, that in a few days all their hectic ſymptoms left them; appetite returned: the ſtumps put on a very healthy appearance, and continued to do ſo, until the ulcer of the ſtump was contracted to about the ſize of a half-crown, when it ſeemed to be ſtationary, diſcharging a thin ichor. Though their appetites were good, and notwithſtanding they had a nouriſhing diet, and good Madeira, and at the ſame time bark and other tonics, they did not appear to gain ſtrength. From their pale and languid countenances, I judged that moderate exerciſe in the open air, in the morning and evening, with the uſe of the cold bath, which happened to be convenient, might have a good effect in reſtoring their general health. I immediately procured crutches for them, and had them plunged into the ſalt water every morning. The good effect was ſoon viſible, not only in their countenances, but the ſore put on a fine, florid, and healthy look, diſcharging good pus, and contracted daily. They all recovered, except one man, a landſman, who was a very irregular liver, and who, notwithſtanding every precaution was taken to prevent it, procured and drank immoderately of new rum; part of a bottle of this poiſonous liquor being found in his bed when he died.

"The bad effects of foul air on ulcers I had an opportunity of witneſſing at the Cape of Good Hope. A great number of the ſeamen and ſoldiers had ulcers, occaſioned by the immoderate uſe of ardent ſpirits, and their not uſing ſufficient vegetable aliment. The climate itſelf is remarked for its ſalubrity, and the Britiſh army for a conſiderable time paſt have been in a ſtate of health, unknown in any other part of the world. Storehouſes appropriated for the reception of the ſick, were then extremely crowded, and the air ſo vitiated, that the ſlighteſt caſe degenerated into the moſt malignant, in the courſe of a few days. Notwithſtanding every effort of very able ſurgeons, numbers died, and many loſt their limbs; none, I believe, recovered from the operation, until they thought of removing them to ſeparate apartments, which had the ſame good effect as at Antigua.

"From what I have obſerved of the bad effect of crowding patients with ulcers, fever, or dyſentery, it appears, that the beſt and moſt powerful remedies will fail, when the patients are deprived of that great pabulum of life, pure atmoſpheric air, on which the preſervation and reſtoration of health ſo much depend. Three feet, the

greateſt ſpace generally allowed between the beds, is not ſufficient in wards containing acute infectious diſeaſes and ulcers; the fetor ariſing from one large ulcer, will contaminate a whole ward, and render the air noxious to animal life.

" On finding ſuch beneficial effects from exerciſe, pure air, and cold bathing, in accelerating the healing of the ſtumps, I was led to try what theſe combined would effect in the cure of the ulcers.

" The ulcers to which ſeamen and ſoldiers are particularly ſubject, are brought on, as I have before remarked, from their not uſing ſufficient vegetable aliment, joined to irregularities, eſpecially the abuſe of ſpirits, heat and moiſture, and expoſure to impure air. In a conſtitution previouſly prepared by ſuch debilitating powers, we can eaſily conceive, that the ſmalleſt ſcratch will degenerate into an ulcer, which, when below the knee, becomes very difficult of cure, often baffling every attempt of the healing art. This ariſes from the ſtate of the fluids, and general debility, but particularly in the extreme parts, where there is a greater deficiency of vital principle, even in health. Perhaps the tendinous ſtructure of the parts, and their depending ſituation, may aſſiſt in retarding the cure of ulcers ſituated upon the lower extremities."

Mr. Henderſon thus deſcribes the *appearance of the ulcer*. " The ulcer generally makes its appearance," ſays he, " on the fore or inner part of the leg, near the ancle, and diſcharges a thin acrimonious matter, excoriating the ſurrounding parts. On neglect or improper treatment, it enlarges daily; the diſcharge becoming more and more acrid, attended with a putrid fetor; fungous excreſcences begin to riſe; the limb becomes œdematous, and very painful. Sometimes, on the leaſt touch, or depending poſition, a hæmorrhage takes place; the bones become carious; putrid ſloughs are caſt off daily; and, from the conſtant irritation, the patient is kept in continual pain; has reſtleſs nights; and a hectic fever with colliquative ſweats ſucceed. In this ſtate, if the operation be not ſoon performed, a diarrhœa generally comes on, which in a few days cloſes the ſcene.

" The progreſs of theſe ſymptoms will depend more or leſs on the conſtitution of the patient, the putrid diatheſis in the ſyſtem, expoſure to miaſmata, and in general to all the prediſpoſing cauſes. In our expedition to St. Juan's, during the laſt war, ſuch was the ſtate of the air at that place, as I was informed by a ſurgeon in actual ſervice there, that the ſlighteſt wound on the lower extremities degenerated into the worſt ſymptoms I have deſcribed of this ulcer, in the courſe of three days, and carried off the patient in ſpite of the moſt powerful antiſepties."

On the *cure of this ulcer*, he ſays, " In the cure of the ulcer, I have found that all relaxing and emollient applications are improper, unleſs when pain and inflammation require their uſe: when theſe ſymptoms are removed, they ſhould be laid aſide. The external

applications, which in a great number of cases have succeeded with me, were warm and stimulant, increasing the action of the extreme vessels, and restoring the parts to their proper tone. With this view, I used the hydrargyr. nitrat. rubr. in powder, and sometimes in the form of ointment, or the solution of arg. nitrat. I often found it necessary to vary those escharotics; or leave them off when the discharge was copious, and apply dry lint, with slips of cerate to defend the edges; and over that a compress of linen, wet in a solution of sacchar. saturn. with the addition of a little camphorated spirit, supported by a roller of thin flannel or cotton, which was moistened in camphorated vinegar, renewed two or three times a-day, and continued from the extremity of the foot to a little below the knee, not to prevent the motion of the joint, nor the action of the muscles. This enabled the patient to use moderate exercise, which I strictly ordered as soon as the pain and inflammation abated. This, with the daily use of the cold salt-water bath, greatly accelerated the healing process, and assisted in restoring the general health. When the discharge was fetid, lint, dipped in tinctures of myrrh or bark, or carrot poultices, corrected the fetor, and lime-juice proved a good detergent.

"While these external means were employed, internal remedies were at the same time administered, with two intentions; first, to correct the putrid diathesis, and produce good juices; secondly, to brace and strengthen the system.

"To answer the first, the bark was given in copious doses; lime-juice, and a large proportion of vegetable aliment, with plenty of good wine; while evacuations, which might lessen the vital principle, as well as debilitating causes, were carefully avoided. The second was effected by preparations of steel, assisted by exercise, and the cold-bath: but what I conceived to be the most efficacious, was a very liberal allowance of pure atmospheric air, which I considered to be of greater importance than all the other remedies; for, deprived of that, all the rest would effect no salutary purpose. The incalculable mischief which the want of that sovereign remedy has produced in our hospitals is well known, and experienced by every medical man of observation.

"In concluding these few remarks, I am sensible that the success we met with did not depend on any particular mode of treatment, differing from the common practice; but was more owing to having it in our power to attack disease on its first commencement, before morbid movements had made much impression; thereby affording us an opportunity of cutting short the disease, or at least obviating its danger. At the same time, cleanliness and wholesome air were particularly attended to, and every cause removed which was likely to aggravate symptoms, or counteract the effect of medicine; while Capt. Rainier very humanely allowed the sick wine and fresh

diet from his table. Without thoſe aids, all our medicines, I fear, would have availed but little."

In conſequence of the remarks of Mr. Ballard, Mr. Edwards writes on this ſubject in the following terms: "My having been for ſome years an aſſiſtant ſurgeon to the Royal Naval Hoſpital at Haſlar, enables me to give the moſt ſucceſsful mode I could find of treating that particular ſpecies of ulcer at the above hoſpital. When thoſe kind of patients were firſt received, they were well waſhed with warm water and ſoap, and if the general debility was not very great, had a doſe of ſome laxative medicine; after its operation, an opiate, the ulcer dreſſed with a large emollient cataplaſm, compoſed of linſeed meal and fine pollard, and before each dreſſing fomented with a ſtrong decoction of Peruvian bark and poppy heads for the ſpace of half an hour, the dreſſing renewed in general twice a-day; but if the ulcer was very foul, with great diſcharge and extenſive ſloughs, it was dreſſed oftener, till it put on a healthy granulating appearance. During the above time, the patient took daily a pint, or ſometimes more, of a decoction of Peruvian bark, after its having gone through the vinous fermentation; the common drink was lemonade; and whilſt in great pain, one grain of opium was given twice or thrice a-day, with a double doſe at night; the ſymptomatic fever which generally attended, was commonly abated by the above means in a few days; wine and porter were alſo given occaſionally in ſuch caſes as required: the ulcer being by the above means brought to a clean healthy appearance, ſlight ſtimulating applications, as cuprum vitriolatum, argentum nitratum, &c. were applied round its edges, in order to accelerate its cicatrization, and a pledget of ſperm. ceti cerate very thinly ſpread upon lint put over the whole ulcer, with a ſoft linen compreſs over that, and a moderately tight bandage over all; the dreſſing renewed once or twice in the twenty-four hours, according to the quantity of diſcharge. After being brought to a ſmall ſize, it often proved very obſtinate to heal over completely; to accelerate which, Mr. Baynton's very excellent mode of treating ulcerated legs, &c. by adheſive plaſters, proved very ſucceſsful, when ſuch happened to be in any of the extremities, and the inferior extremities are the chief ſubject of ſuch ulcers. During the cure, the patients lived chiefly on animal food and vegetables, with good ſoup, which, no doubt, contributed in a great degree to mend the general health, as the patients' countenances on their firſt admiſſion always appeared wan and dejected, which was a proof that digeſtion and chylification went on but imperfectly; therefore, I have every reaſon to believe, if the nitrous fumigation is perſiſted in daily on ſhipboard, particularly in the Sick Bay, with frequently bathing the men in a cold or tepid ſalt-water bath, it would tend very much to invigorate their ſyſtems, better enable the organs of digeſtion to perform their office, and prevent the contagion of thoſe ulcers, as it is evident their contagion and obſtinacy proceed from the vitiated ſtate of the body; for

if any eſcharotic is applied to them before the general habit is mended, it corrodes the muſcular ſubſtance, whereas, if the habit of body is good, it will produce fine florid granulations.

" During the whole of laſt winter, I was attending the ſick and wounded Ruſſian troops, that were received into the temporary general hoſpital at N. Yarmouth, after being wounded in Holland. From the number we had there, they were obliged to be ſtowed very cloſe together in low-ceiled houſes, and ſome of thoſe houſes ſituated in very cloſe ſwampy ſituations, where they could get but little light, and leſs good air. The fetor of their wounds, as may be ſuppoſed, muſt be great, and the men being naturally filthy in their perſons, muſt make it ſtill worſe; however, by the ſtrict attention paid to the nitrous fumigation, and frequent uſe of the ſalt-water bath, by order of Dr. Scot, aſſiſtant inſpector of hoſpitals, who ſuperintended the medical department there, every appearance of contagion was prevented. In ſome of the convaleſcent quarters, a few caſes of ſynochus broke out; but by ſeparating them, and perſevering in the fumigation, it went no farther. I applied the nitrous gas to foul ſloughing ulcers, by means of a tube from the top of a patent fumigating lamp, and it had the effect of cleaning them; but the foulneſs and ſloughing returned in a few dreſſings after the gas was omitted; theſe ulcers were afterwards brought to a clean healthy ſtate by the application of the common cataplaſm, made with ſea in lieu of common water, and applied cold, without any intervening ſubſtance, except in ſome caſes, where, from the irritability of the ulcer, it could not be borne; in thoſe caſes dry lint anſwered the intention better than greaſy applications. In ſome of them I was obliged to continue the poultice till the ulcer completely healed, for when it was left off the ulcer relapſed, but renewing the poultice ſoon counteracted its regeneration. In ſome of thoſe vitiated ulcers, the common poultice, with the cortical part of a freſh carrot ſcraped fine, and applied over it, had alſo a very good effect: I gave no medicine internally to them, except an opiate at night, whilſt the appetite kept good. A nouriſhing diet was given of animal food boiled down into ſoup, with plenty of vegetables and Scotch barley, or oatmeal to thicken it."

Though the whole of theſe remarks are not ſtrictly in point, the facts ſtated, both by the writer and Mr. Ballard, are, nevertheleſs, of importance. We ſuſpect it to be an ulcer of the foregoing deſcription which furniſhed the following excellent example of the effect of the application of *gaſtric juice* to ſores. Dr. Harneſs, phyſician to the fleet, gives the following caſe as an evidence of the benefits likely to reſult from the uſe of this remedy:

" Mr. Thomas Corben, boatſwain of his Majeſty's ſhip Egmont, was, on the 31ſt of July, 1796, received into the Dolphin hoſpital ſhip, in conſequence of a very bad ulcer of the right leg, which was

fully ſix inches in length and four in breadth. The ſurrounding integuments were detached for ſome conſiderable way, and their margin, with very much the greater portion of the ſurface of the ulcer, was in a ſphacelated ſtate. The matter diſcharged was ſo extremely acrid, as to excoriate every part which it touched, and had inſinuated itſelf through the whole length of the interſtices of the gaſtrocnemius and ſoleus muſcles. From between theſe muſcles, which were detached from the bone nearly the whole length of the ulcer, a very large quantity of a moſt offenſive matter was diſcharged, a conſiderable portion of which lodged in a cyſt formed by the detached integuments on the poſterior and inferior parts of the leg.

"There was a very great tenſion the whole length of the extremity. The general health was much impaired.

"Having," continues Dr. Harneſs, "in the courſe of a long and extenſive practice, been too frequently a witneſs to the inefficacy of the applications hitherto made uſe of in the navy in the treatment of ſcorbutic ulcers (viz. citric acid, bark, myrrh, rhubarb, and opium, ſeparately or variouſly combined), and more particularly in warm climates, where ſphacelus and eroſions have taken place in any conſiderable degree, to which every ſeaman is peculiarly liable; I was induced, from the very unfavourable appearance of the caſe above related, to have recourſe, with the concurrence of Mr. Gray, ſurgeon of the hoſpital ſhip, to the *gaſtric fluid of graminivorus animals*, which I knew could be readily obtained from the bullocks and ſheep killed daily for the uſe of the fleet. From a bullock killed in the evening, nearly three pints of the juice were obtained, with part of which the ſurface of the ulcer was waſhed, as well as all the ſinuſes, by injecting the fluid into them in different directions by a ſyringe, with a long and ſlender tube. Superficial dreſſings of lint were then applied, and particular attention was paid to prevent, by compreſſes and bandages, a further inſinuation of matter, as well as to preſerve the parts in contact, as far as their diſeaſed ſtate would admit of, that every advantage might be derived from the adheſive inflammation which I expected the remedy to excite. The above means were purſued night and morning. On removing the dreſſings upon the third day, the whole of the ſphacelated parts was thrown off, which expoſed a large portion of the tibia in two different places, to which pledgets of lint dipped in the fluid, were applied. This not only appeared to prevent the injuries uſually attendant on thoſe caſes (viz. diſcolouration and exfoliation), but on the contrary, in the courſe of eight days, the parts thus expoſed were entirely covered by new granulations, and at the expiration of fourteen days, all the ſoft parts were perfectly reunited, and the ſurface of the ulcer reduced to a ſore of about two inches and a half in diameter, with its granulations ſmall, and compact, and of a beautiful florid colour. It

is at preſent perfectly healed, and the patient, although a very luſty man, enabled, by the aſſiſtance of an elaſtic bandage, to attend to the duties of the ſhip.

" After the three firſt dreſſings, the gaſtric fluid of ſheep only was uſed, not being able, from the ſhip being at ſea, to obtain more from bullocks. The fluid, if poſſible, ſhould be procured freſh every day.

" To remedy his general ill health, an aperient medicine was firſt given; after which he took half a drachm of bark in two ounces of the decoction every ſix hours, and had directions to make uſe of as many lemons and onions in the courſe of the day as his ſtomach would eaſily bear. It was aſtoniſhing to obſerve with what rapidity he regained his ſtrength after the ſphacelated parts were thrown off.

" I have ſince had the pleaſure of finding the application of the gaſtric fluid ſucceed in more than a hundred caſes of ſphacelus, and the teſtimonies given of its peculiar good effects in theſe caſes by Mr. Jones, ſurgeon of the Naval Hoſpital at Baſtia, and by Meſſrs. Bead and Buck, two of his principal aſſiſtants, convince me of the importance of making its efficacy generally known.

" I have at preſent a patient in the Dolphin, a ſeaman belonging to the Barfleur, Vice-admiral Waldegrave, who, from being confined to his bed by typhus fever, became excoriated in three different places, the whole of which terminated in extenſive mortifications; the ſloughs of which are entirely removed by the gaſtric fluid, and the patient ſufficiently recovered to walk about."

We recollect, many years ago, to have ſeen the application of the gaſtric juice of animals to ulcers, by the late Mr. Juſtamond, at the Weſtminſter hoſpital: but the means of *deſtroying the virus of ulcers*, and *contagious miaſmata*, ſeem to have been moſt ably deſcanted on by Dr. Rollo, in his excellent treatiſe on the Diabetes Mellitus. Indeed, the manner in which Dr. Rollo treats this ſubject, makes it a branch of that extenſive and hitherto unexplored ſcience, animal chemiſtry; and affords us new hopes of ſeeing the reſources of medicine and ſurgery increaſed, by a practical application of the doctrine of pneumatic chemiſtry.

Dr. Rollo examines the action of morbid matter on wounds. Independent of the ulcers which uſually follow eryſipelas, and of thoſe which are known by the term of hoſpital ulcers, he believes he has obſerved a particular ſpecies proceeding from a *deleterious germ which attaches to a part of the wound*; which, like other poiſons, poſſeſſes the property of *aſſimilation*, increaſing by its own progreſſive virulence; but which does not affect other ulcers of a ſpecific character, ſuch as the venereal, ſcrophulous, and variolous.

Dr. Rollo has endeavoured to deſtroy this morbid poiſon by chemical means, locally applied; for this purpoſe he made uſe of the oxygenated muriatic acid, the nitrates of ſilver and mercury, and the

oxygenated muriatic acid gas. The manner of applying these substances is as follows: The wound ought first to be washed with luke-warm water; immediately after which the ulcerated part should be touched with the nitrat of silver; the wound then must be moistened with a solution of the nitrat of mercury diluted with water, or a mixture of oxygenated muriatic acid and distilled water; after which, the whole is to be covered with linen dipped in one or the other of these liquids. The oxygenated muriatic gas is immediately directed to the ulcer, and the diluted solution of the nitrate of mercury is, as before prescribed, applied to the wound. By this treatment the wound soon becomes cicatrized: this experiment has failed only in cases where the ulceration was so extensive that it could not be entirely covered with the nitrate of silver, or the oxygenated muriatic acid gas.

One of these ulcers, after having been dusted with a considerable quantity of the nitrate of silver reduced to a fine powder, appeared to be in an excellent condition, twelve hours after this dressing; it was firm, and apparently much revived; an effect which must have been produced by the sulphurated hydrogen gas acting on the surface of the ulcer.

Dr. Rollo gives an account of some experiments published by Dr. Crawford, in the lxxx. vol. of the "Philosophical Transactions," on the *matter of cancer*; and expresses his regret, that this valuable paper is not more generally known: as, says he, "*there can be little doubt of chemical changes and combinations being produced on sores.*" Dr. Rollo farther observes, "that this subject has not been carried on, since then, as it ought to have been; trusting it will gradually appear of great importance, especially as the discovery of the changes the discharge of a sore undergoes, will probably point out, at the same time, the remedy for the sore."

Before, however, we can proceed to give the result of Dr. Crawford's ingenious experiments, together with the opinions of this eminent medical philosopher, we shall previously furnish the reader with a concise description of the apparatus by means of which different gases may conveniently be applied to ulcers.

It consists of a glass bottle, or decanter, designed to contain the materials necessary to produce the gas; a vial, or small flask, intended to contain the acid, and which allows it to pass, at pleasure, into the decanter, by means of a cock. There is also a glass tube which serves to conduct the gas, and to the extremity of which, a bladder must be fixed. Mr. *Blades*, of Ludgate-Hill, London, sells this apparatus. The bladder is used only when the gas is to be applied for a certain length of time, and in order to keep it uniformly distended with facility, on renewing the effervescence as occasion may require. As to the oxygenated muriatic acid gas, its effect is very quick, or almost instantaneous, so that it is only necessary to apply the orifice of the tube to the wound, for a few seconds,

In Dr. Crawford's experimental enquiry into *the nature of cancerous matter*, the following important obſervations occur, which are eſpecially to our preſent purpoſe:

"It appears," ſays he, "from the experiments which have been recited, that in cancerous and other malignant ulcers, the animal fibres undergo nearly the ſame changes which are produced in them by deſtructive diſtillation. The purulent matter prepared for the purpoſe of healing the ulcer is, in ſuch caſes, mixed with animal air and volatile alkali. The compound formed by the union of theſe ſubſtances, which may perhaps not improperly be termed hepatiſed ammonia, decompoſes metallic ſalts, and acts upon metals; for we have ſeen that when it was placed in a jar over mercury for ſeveral days, the ſurface of the mercury acquired a black colour, and that it inſtantly occaſioned a dark precipitate in a ſolution of nitrated ſilver. Theſe facts ſeem to afford an explanation of the changes produced in metallic ſalts, when they are applied to malignant ulcers. The volatile alkali combines with the acid of the metallic ſalt, and the animal hepatic air revives the metal, either by imparting to it the inflammable principle, or by uniting with the pure air which the ſalt is ſuppoſed to contain. The metal, thus revived, is probably in ſome caſes again corroded by the hepatiſed ammonia, which communicates to it a black colour. Thus we may account for the dark incruſtation frequently formed upon the tongue and internal fauces, when venereal ulcers of the throat are waſhed with a ſolution of corroſive ſublimate. And hence alſo the dark tinge which is frequently communicated by ill-conditioned ulcers to poultices made with a ſolution of ſugar of lead. The action of the hepatiſed ammonia likewiſe explains the reaſon why the probes are frequently corroded when they are introduced into ſinuous ulcers, or applied to the ſurfaces of carious bones. To the ſame cauſe it is probably owing, that poliſhed metallic veſſels are quickly tarniſhed when they are expoſed to the effluvia of putrid animal ſubſtances.

"From the foregoing experiments it moreover appears, that animal hepatic air imparts to the fat of animals recently killed a green colour; that it renders the muſcular fibres ſoft and flaccid, and increaſes the tendency to putrefaction. It is therefore a ſeptic principle; and hence it is extremely probable, that the compound of this fluid with volatile alkali, which is found in the matter diſcharged by the open cancer, produces deleterious effects: for although the miſchief in cancerous ulcers ſeems principally to depend on a morbid action of the veſſels, whence the unhealthy ſtate of the matter diſcharged by ſuch ulcers is ſuppoſed to derive its origin, yet, from the corroſion of the larger blood-veſſels, and the obſtruction in the contiguous glands, there can be little doubt that this matter aggravates the diſeaſe. The experiments recited above appear to prove, that the hepatiſed ammonia is the ingredient which communicates to

the cancerous matter its putrid ſmell, its greater thinneſs, and in a word, all the peculiar properties by which it differs from healthy pus.

"From theſe conſiderations it was inferred, that a medicine which would decompoſe the hepatiſed ammonia, and deſtroy the fetor of the animal hepatic air, without at the ſame time increaſing the morbid action of the veſſels, would be productive of ſalutary effects. The nitrous acid does not deſtroy the fetor of hepatic air, unleſs it be highly concentrated; and in this ſtate it is well known that it ſpeedily corrodes animal ſubſtances. But the fetor of hepatic air quickly diſappears when it is mixed with the dephlogiſticated marine acid, even though the latter be ſo much diluted with water to render it a very mild application. I have found that this acid, diluted with thrice its weight of water, gives but little pain when it is applied to ulcers that are not very irritable; and in ſeveral caſes of cancer it appeared to correct the fetor, and to produce a thicker and more healthy pus. It is proper, however, to remark, that other caſes occurred in which it did not ſeem to be attended with the ſame ſalutary effects. Indeed ſome cancerous ulcers are ſo extremely irritable, that applications which are at all of a ſtimulating nature, cannot be ventured upon with ſafety. And hence, if the obſervations which I have made on the efficacy of this acid as an external application, ſhould be confirmed by future experience, it muſt be left to the judgment of the ſurgeon to determine both the degree of its dilution, and the caſes in which it may be employed with advantage.

"The dephlogiſticated marine acid, as is generally known, has the power of deſtroying the colour, the ſmell, and, perhaps, the taſte, of the greater part of animal and vegetable ſubſtances. We have ſeen that it corrects the fetor of putrid fleſh. And I have found, that when it is poured in ſufficient quantity upon hemlock and opium, theſe narcotics ſpeedily loſe their ſenſible qualities. As it appears, therefore, to poſſeſs the power of correcting the vegetable, and probably many of the animal poiſons, it ſeemed not unlikely, that it might be uſeful as an internal medicine. Conceiving that its exhibition would be perfectly ſafe, I once took 20 drops of it, diluted with water. I ſoon afterwards, however, felt an obtuſe pain, with a ſenſe of conſtriction in my ſtomach and bowels. This uneaſineſs, notwithſtanding the uſe of emetics and laxatives, laſted for ſeveral days, and was at length removed by drinking water impregnated with ſulphureous hepatic air. I afterwards found that the manganeſe, which had been uſed in the diſtillation of the acid, contained a ſmall portion of lead.

"Dr. Ingenhouz informed me, that a Dutchman of his acquaintance, ſome time ago, drank a conſiderable quantity of the dephlogiſticated marine acid: the effects which it produced were ſo extremely violent, that he narrowly eſcaped with his life. If, therefore, this acid ſhould hereafter be employed as an internal medicine,

it would be neceſſary to prepare it by means of manganeſe that has been previouſly ſeparated, by a chemical proceſs, from the lead and the other metals with which that ſubſtance is uſually contaminated."

The foregoing remarks induced Dr. Rollo to prevail on Mr. Cruickſhank to make ſome *experiments on the matter of this ſore.* The following account contains the reſult, with his remarks, as communicated in April, 1795.

"The matter of this ſore is ſparingly ſoluble in water, but readily diffuſed through it, producing a milky appearance. Pure volatile alkali firſt reduces it to a tranſparent jelly, and after ſome time diſſolves the greateſt part; a ſimilar effect is produced on pure pus. Theſe ſolutions are but partially precipitated by acids, particularly the ſulphuric. The tincture of litmus and of Brazil wood are not changed by this matter; it does not therefore poſſeſs either acid or alkaline properties. If to the filtered ſolution of this matter in diſtilled water, a little nitrated ſilver be added, a whitiſh-coloured precipitate will be produced. Similar precipitates, but much more copious, are occaſioned by nitrated and muriated mercury. When pure pus is treated in the ſame manner, theſe precipitates, particularly that by muriated mercury, have ſomewhat of a different appearance, which it would be difficult to deſcribe. The fetid ſmell is ſomewhat changed by lime-water, but not deſtroyed; the ſulphuric acid rather increaſes it; a ſimilar effect is produced by alcohol, and by the alkaline ſolution of arſenic. A decoction of the Peruvian bark does not deſtroy the fetor. This, however, is effected by the nitrates and muriates of mercury, by the nitrous acid; but moſt completely by the oxygenated muriatic acid and gas. Nitrated ſilver produces very little change either on its colour or ſmell, a circumſtance the more remarkable, as this ſalt poſſeſſes the property of deſtroying moſt offenſive ſmells, even that of the matter of cancer.

"It muſt be allowed, that the offenſive ſmell of the matter of this ſore is produced by that part of the diſcharge which is altered from the nature of pure pus; for we know that every ill-conditioned diſcharge has more or leſs ſmell, while good pus has none. It is a known fact in chemiſtry, admitting of few exceptions, that a ſubſtance cannot have its ſmell totally deſtroyed or altered, without having its properties changed at the ſame time. If therefore, this peculiar matter, by the addition of nitrated or muriated mercury, the oxygenated muriatic acid, &c. ſhould have its ſmell completely deſtroyed, there is every reaſon to believe that its peculiar properties alſo will be ſo; and ſhould it be capable in its original ſtate of producing an ill-conditioned action in ſores, the addition of ſuch ſubſtances might prevent this miſchief. If it ſhould be ſuppoſed, therefore, that an acrid matter ſomehow produced on the ſurface of ſores, were capable of inducing ulceration of a ſpecific

kind, and that this ulceration, like the venereal, ſhould generate more matter of a nature ſimilar to itſelf, capable of extending the miſchief, and even of bringing on a general affection of the ſyſtem, ſome important concluſions might be drawn from theſe experiments.

" 1ſt. It is eaſy to ſee, that a ſore once clean, might be preſerved from the effects of the matter alluded to, by waſhing it at every dreſſing with a weak ſolution of nitrated mercury, or the oxygenated muriatic acid, and that even the generation of ſuch matter might be entirely prevented by the ſame means.

" 2d. After the action has taken place, and before a general diſpoſition is formed, it might be poſſible to put a ſtop to its progreſs by very active topical applications, ſuch as ſhould be capable not only of deſtroying the ſpecific nature of the matter generated, but alſo the action itſelf. From the experiments already related, it is evident we would prefer, in this caſe, the moſt active mercurial preparations, ſuch as red precipitate not entirely deprived of its acid, or the muriated mercury; and if an actual cauſtic were to be employed, we ſhould have recourſe to the ſtrong nitrous acid, applied in Mr. Humpages's method, rather than the nitrated ſilver, eſpecially as it may have alſo the effect of changing the nature of the diſcharge; this conſiſts in dipping a little lint in the acid, and applying it to the part: it communicates leſs pain than any other cauſtic, except the nitrate of ſilver.

" With regard to the action of the different ſubſtances on ſores, and as cauſtics, they may be thus arranged:

" 1ſt. Subſtances exciting action, and producing death, in parts, by the exceſs of that action; as arſenic, and muriated mercury.

" 2d. Subſtances acting ſimply by burning or deſtroying the part, and whoſe actions are always limited; as, nitrated ſilver, nitrated mercury, and nitrous acid.

" 3d. Subſtances acting by diſſolving the part, and whoſe action is ſo diffuſive that it is difficultly limited; as, common cauſtic, or the mixture of pot-aſh and lime.

" 4th. Subſtances acting chemically on the part by decompoſition; as, oxygenated muriatic acid, in the form of gas, or combined with water.

" On the whole, though we have ſuppoſed the formation of a new morbid poiſon, on the ſurface of certain ſores, under peculiar circumſtances or management, yet we are rather inclined to change the appellation *new*, to a poiſon which has been probably *overlooked*. We have ſeen the commencing ulceration remain ſome days ſtationary; we have ſeen it extending, while the other parts of the former ſore were cicatriſing, and the conſtitutional effects not taking place until the ulceration had occupied a large part of the ſore; and we have ſeen that the painful ſtate and extreme ſen-

fibility did not occur until the ſyſtem was affected. Therefore it may be preſumed the early ulceration has been unattended to, and the ſtate of the ſore remarked only by authors after it had aſſumed the appearance of phagedæna. For when the ulceration had ſo ſpread as to produce the conſtitutional affection, and the conſequent rapid changes on the ſore, the character of the virulent ſore deſcribed as phagedæna was formed."

"The account we have given of this ſore," continues Dr. Rollo, "may excite more attention to the ſtate of a large ſore in an hoſpital with a conſiderable diſcharge, and lead to a trial of the applications pointed out;—to forward cicatriſation, and prevent any untoward changes from the production of a poiſon on the ſurface of the ſore.

"Since the attention and manner of treating ſores as deſcribed, have been purſued in this hoſpital, we have had none ſuch, nor even the *hoſpital-ſore*; indeed this we cannot poſſibly have, as ventillation and the deſtruction of general contagion are ſo carefully and unremittingly performed. We have had, however, three very remarkable ſores following bubo in the groin, and chancre on the penis, which terminated fatally. Theſe caſes occurred before the adoption of the new remedies, and were treated by mercury, and appeared to be the effect of the mercurial diſeaſe on a peculiar conſtitution. The ſores were irritable and ſloughing, and the only favourable changes were produced by the uſe of opium, the hepatiſed ammonia, and the application to the ſores of the hydrogenous, hepatic, and carbonic acid gaſes.

"The ſore which has been deſcribed and noticed by us at the beginning of this account as peculiar to hoſpitals, though well marked by many, yet we have our doubts, but that many of theſe were this peculiar ſore, and owing to the poiſon we have ſuggeſted. Whatever it may be, it adds another fact in corroboration of the advantages both medicine and ſurgery are likely to derive from the new doctrines of chemiſtry.

"We have already ſeen the utility of ſubſtances readily parting with their oxygen, applied to irritable ſores, and alſo of the hydrogenous, hepatic, and carbonic acid gaſes to irritable ſores (ſee v. I. p. 62.), and which was contained in the Notes of the firſt caſe of Diabetes, diſperſed in January laſt. In page 501 of the ſame volume it is obſerved, that the oxygenated muriatic gas was found to deſtroy the offenſive ſmell of ſores, that it deſtroyed ſpecific contagion, and could be eaſily obtained, and very ſafely uſed. We had therefore given it a preference to other things, and in order that it may be more generally tried, we inſert Mr. Cruickſhank's manner of procuring and uſing it in the wards of this hoſpital.

"This conſiſts in intimately mixing two parts of common ſalt, and one of cryſtalliſed manganeſe, previouſly reduced to powder. Two ounces of this compound are introduced into a ſmall baſin;

about an ounce of water is then added, and afterwards an ounce and half of the concentrated vitriolic or ſulphuric acid at different times, ſo as to preſerve a gradual diſcharge of the oxygenated muriatic acid gas. One of theſe baſins is ſufficient for a ward or room containing five or ſix beds, and more muſt be employed according to the ſize of the apartment."

SECT. XIII. *Of the Cure of Old Ulcers of the Leg by the mechanical Approximation of their Boundaries.*

A moſt ingenious method of treating ulcers of long ſtanding, on the lower extremities, has been practiſed of late years by Mr. Baynton, a ſurgeon in Briſtol, who has publiſhed a treatiſe on the ſubject.

In this intereſting work he aſſerts, "that the means propoſed by him will, in moſt inſtances, be found ſufficient to accompliſh cures in the worſt caſes, without pain or confinement. After having been repeatedly diſappointed in the cure of old ulcers, Mr. Baynton determined on *bringing the edges of old ulcers nearer together by means of ſlips of adheſive plaſters.* To this he was chiefly led, from having frequently obſerved, that the probability of an ulcer continuing ſound, depended much on the ſize of the cicatrix which remained after the cure appeared to be accompliſhed; and from well knowing, that the true ſkin was a much more ſubſtantial ſupport and defence, as well as a better covering, than the frail one which is obtained by the aſſiſtance of art. But, when he had recourſe to the adheſive plaſter, with a view to leſſen the probability of thoſe ulcers breaking out again, he little expected, that an application ſo ſimple would prove the eaſieſt, moſt efficacious, and moſt agreeable means of treating ulcers."

Although the firſt caſes, in which Mr. Baynton tried this practice were of an unfavourable nature, yet he had ſoon the ſatisfaction to perceive that it occaſioned very little pain, and materially accelerated the cure, while the ſize of the cicatrices were much leſs than they would have been, had the cures been obtained by any of the common methods.

At firſt, however, the ſucceſs was not quite perfect; as in many inſtances he was not able to remove the ſlips of plaſter, without removing ſome portion of the adjacent ſkin, which, by occaſioning a new wound, proved a diſagreeable circumſtance, in a part ſo diſpoſed to inflame and ulcerate, as in the vicinity of an old ſore. He therefore endeavoured to obviate that inconvenience by keeping the plaſters and bandages well moiſtened with ſpring-water, for ſome time, before they were removed from the limb. He had ſoon the ſatisfaction to obſerve, that the inconvenience was not only prevented, but that every ſucceeding caſe juſtified the confidence he

now began to place in the remedy. He alſo diſcovered, that moiſtening the bandages was attended with advantages which he did not expect: while the parts were wet and cool, the patients were much more comfortable in their ſenſations, and the ſurrounding inflammation was ſooner removed than he had before obſerved it to be.

By the mode of treatment here recommended, Mr. Baynton found that the diſcharge was leſſened, the offenſive ſmell removed, and the pain abated in a very ſhort time. But, beſides theſe advantages, he alſo found, that the callous edges were in a few days level with the ſurface of the ſore; that the growth of fungus was prevented, and the neceſſity of applying painful eſcharotics much leſſened, if not entirely done away. Mr. Baynton very properly gives a minute deſcription of this method, which he would recommend, of treating ſuch ulcers in their different ſtages. Of theſe uſeful particulars, we ſhall give the reader a full account.

"The parts (ſays he) ſhould be firſt cleared of the hair, ſometimes found in conſiderable quantities upon the legs, by means of a razor, that none of the diſcharges, by being retained, may become acrid, and inflame the ſkin, and that the dreſſings may be removed with eaſe at each time of their renewal, which, in ſome caſes, where the diſcharges are very profuſe, and the ulcers very irritable, may, perhaps, be neceſſary twice in the twenty-four hours, but which I have, in every inſtance, been only under the neceſſity of performing once in that ſpace of time.

"The plaſter ſhould be prepared by ſlowly melting, in an iron ladle, a ſufficient quantity of litharge plaſter or diachylon, which, if too brittle, when cold, to adhere, may be rendered adheſive by melting half a drachm of reſin with every ounce of the plaſter; when melted it ſhould be ſtirred till it begins to cool, and then ſpread thinly upon ſlips of ſmooth porous calico, of a convenient length and breadth, by ſweeping it quickly from the end, held by the left hand of the perſon who ſpreads it, to the other held firmly by another perſon, with the common elaſtic ſpatula uſed by apothecaries; the uneven edges muſt be taken off, and the pieces cut into ſlips, about two inches in breadth, and of a length that will, after being paſſed round the limb, leave an end of about four or five inches. The middle of the piece ſo prepared, is to be applied to the ſound part of the limb, oppoſite to the inferior part of the ulcer, ſo that the lower edge of the plaſter may be placed about an inch below the lower edge of the ſore, and the ends drawn over the ulcer with as much gradual extenſion as the patient can well bear; other ſlips are to be ſecured in the ſame way, each above and in contact with the other, until the whole ſurface of the ſore and the limb are completely covered, at leaſt one inch below and two or three above the diſeaſed part.

"The whole of the leg ſhould then be equally defended with pieces of ſoft calico, three or four times doubled, and a bandage of

the ſame, about three inches in breadth, and four or five yards in length, or rather, as much as will be ſufficient to ſupport the limb from the toes to the knee, ſhould be applied as ſmoothly as can be poſſibly performed by the ſurgeon, and with as much firmneſs as can be borne by the patient, being firſt paſſed round the leg, at the ankle-joint, then as many times round the foot as will cover and ſupport every part of it, except the toes, and afterwards up the limb till it reaches the knee, obſerving that each turn of the bandage ſhould have its lower edge ſo placed as to be about an inch above the lower edge of the fold next below.

"If the parts be much inflamed, or the diſcharges very profuſe, they ſhould be well moiſtened, and kept cool with cold ſpring water poured upon them as often as the heat may indicate to be neceſſary, or, perhaps, at leaſt, once every hour. The patient may take what exerciſe he pleaſes, and it will be always found, that an alleviation of his pain and the promotion of his cure will follow as its conſequence, though under other modes of treating the diſeaſe it aggravates the pain, and prevents the cure.

"Theſe means, when it can be made convenient, ſhould be applied ſoon after riſing in the morning, as the legs of perſons affected with this diſeaſe are then found moſt free from tumefaction, and the advantages will be greater than when they are applied to limbs in a ſwollen ſtate. But at whatever time the applications be made, or in whatever condition the parts be found, I believe it will always happen, that cures may be obtained by theſe means alone, except in one ſpecies of the diſeaſe, which ſeldom occurs, but that will hereafter be deſcribed. The firſt application will ſometimes occaſion pain, which, however, ſubſides in a ſhort time, and is felt leſs ſenſibly at every ſucceeding dreſſing. The force with which the ends are drawn over the limb muſt then be gradually increaſed, and when the parts are reſtored to their natural ſtate of eaſe and ſenſibility, which will ſoon happen, as much may be applied as the callico will bear, or the ſurgeon can exert; eſpecially if the limb be in that enlarged and incompreſſible ſtate which has been denominated the ſcorbutic, or if the edges of the wound be widely ſeparated from each other."

The author next adverts to the circumſtance, which occaſionally proved troubleſome, namely, the breaking of the ſkin in the vicinity of the ſores; owing partly to the mechanical effect of the adheſive ſlips, and partly to the irritating quality of the plaſter. He, however, conſiders theſe ſores of conſequence only when lying over the tendon Achilles, in which ſituation they ſometimes require "the care of many weeks," and to guard againſt which, he recommends the intervention of a ſmall ſhred of ſoft leather before the ſlip of plaſter is applied.

"It may be neceſſary to add (continues Mr. B.), that cures will be generally obtained without difficulty, by the mere application of

the ſlips and bandage; but when the parts are much inflamed, and the ſecretions great, or the ſeaſon hot, the frequent application of cold water will be found a valuable auxiliary, and may be always ſafely had recourſe to where the heat of the parts is greater than is natural, and the body free from perſpiration."

The author attempts to account for the ſucceſs of this treatment, not altogether in a ſatisfactory manner; but this is of little moment, provided farther trials prove favourable. Of the action produced by the plaſter, he gives the following ſummary deſcription:

"In recent ulcers, it forms an uniting bandage, which enables us immediately to approximate retracted parts, and affords a temporary ſubſtitute for the healthy integuments, not liable to the inconveniences incident to thoſe when weakened by a long-continued courſe of diſeaſe. When it is applied ſo as to afford ſupport to the whole of the diſeaſed limb, perſons may walk great diſtances, or even indulge in irregularities, without obſtructing their cures, as it ſubjects every part to the effects of the natural actions of the contiguous parts, and aſſiſts eſſentially the individual actions of each part concerned in the buſineſs of repair; and whether ſlough is to be removed, pus to be ſecreted, granulations to be formed, or ſkin to be reproduced, it happens that each of theſe actions commences and proceeds in the natural order of their ſucceſſion, whether the diſeaſe be recent, or in that ſtate of habitual ulceration which has been termed the irritable; or whether, after long continuance, and the expenditure of the powers of the parts, it has fallen into a ſtate of inactivity, and acquired the characteriſtic of deficient abſorption, the callous edge."

In a matter ſo truly important to ſurgery, it is highly neceſſary to adduce the facts brought forward by Mr. Baynton in ſupport of his diſcovery: the following caſes ſeem to be very ſatisfactory in this view:

Case I. "Hannah Webb, aged thirty-two, ſervant to Joſiah Hill, eſq. of Bedminſter, applied to me, by the deſire of her maſter, on the 24th of November, 1792, for the cure of two ulcers on the left leg: one, ſituated on the outer and lower edge of the ſoleus muſcle, was about two inches long, an inch wide, and very deep; the other, ſituated a little below the external malleolus, was an inch long, half an inch wide, and of a triangular form. The edges of both were callous, the diſcharge thin, and the ſurrounding parts very much inflamed. She ſaid, that ſhe had ſuffered very much for upwards of two years, being obliged to walk and ſtand a great deal; that ſhe had been twelve months under the care of a gentleman in the neighbourhood, who, beſide great perſonal attention, gave her conſiderable quantities of alterative, and other medicines. That ſhe had alſo the occaſional aſſiſtance and advice of other gentlemen before ſhe made application to him; and it ſeemed by her account, that ſhe had tried

every remedy, except abſolute reſt in bed (which was only occaſionally reſorted to), that could be ſuggeſted, without any advantage. The adhéſive plaſter, ſpread on ſlips of callico, were applied to the lower ulcer, and ſecured by its adheſive property as well as the ſituation and ſhape of the ulcer would allow. The upper ulcer was treated in the ſame way, with ſlips of the ſame kind drawn firmly round the limb, ſo as to bring the retracted edges nearer together; which was not difficult to accompliſh, as that wound was ſituated in a yielding part, and was alſo very deep. The parts were then defended with pieces of callico, and a bandage of the ſame kind, three yards in length, was applied ſpirally with ſome firmneſs round the limb. She was directed to keep it conſtantly well wetted with cold water poured from a tea-pot upon the parts, to live ſparingly, and to take what exerciſe ſhe pleaſed. At my next viſit, the 25th, I was very much ſurpriſed at the change that had taken place in only twenty-four hours: the edges were much reduced, the diſcharge was much better, the inflammation much leſs, and ſhe ſaid that ſhe had experienced more eaſe than ſhe had known in the ſame ſpace of time for many preceding months. She was dreſſed every day in the ſame manner; and, by the ninth of the following month, a period of only fifteen days, both wounds were perfectly cured.

"The celerity of this cure may be aſcribed to the patient being of a ſpare form, and poſſeſſing much looſe ſkin upon her leg, which permitted the divided parts to be brought nearly into contact. Thus with no other internal medicine than one aperient draught, which perhaps was unneceſſary, this perſon, in only fifteen days, was cured of a diſeaſe that had reſiſted the art of ſurgery upwards of two years.

"It may be neceſſary to remind the reader, that in all of theſe caſes a kind of *fulcrum* has been formed, by applying the middle part of the adheſive ſlip exactly oppoſite to the ulcer on the ſound part of the limb, to enable the *moving power* that is applied to bring the ſides of the ulcer nearer together when the ends of the plaſter are drawn over the affected part.

Case II. "Mr. James Harris, ſhopman to Mr. Dowell, iron-merchant, applied to me by his maſter's deſire, with ſeveral large and very irritable ulcers on different parts of his leg, which, from the knee, was ſo diſeaſed by inflammation and ulceration, that I could have entertained no hope of being able to cure him by any of the common methods of treating ſuch diſeaſes.

"He ſaid, that in the year 1783, being employed at a tin-plate manufactory, he had the misfortune to plunge his leg into a pot of boiling greaſe, and that, on turning down the ſtocking, a great part of the ſkin and fleſh came off, that he was immediately placed under the care of a ſurgeon of reputation, and continued with him nearly two years, at the end of which time, having a callous obſti-

nate ulcer of the ſize of the palm of the hand, he applied to another eminent ſurgeon, and remained under his care ten months, with little advantage; that he was under the care of no regular practitioner, but continued to try every thing that was recommended by his friends and neighbours for a year from that time; that he then got admiſſion into an hoſpital, and after ten months was diſcharged nearly in the ſame ſtate that he was in when firſt admitted: he alſo ſaid, that afterwards he was attended by different practitioners, without experiencing any relief.

At the time he applied to me, his caſe was, in every reſpect, one of the moſt hopeleſs I had ever ſeen: it had been occaſioned by the effects of *fire*, a cauſe that ever ſtamps the character of obſtinacy on wounds that are ſo occaſioned; it had been of more than nine years ſtanding; it had reſiſted the ſkill of many gentlemen that I knew to be experienced in the practice of ſurgery; very much of the common covering was deſtroyed, and what remained was ſo thickened by inflammation, that it would have been preſumption to hope that a cure could be obtained. But as I expected that relief might be afforded, I for ſome months unremittingly endeavoured to aſſiſt him by all the common methods I was acquainted with, except abſolute reſt in bed, without the leaſt advantage. The high degree of inflammation that conſtantly attended this diſeaſe ſeemed to put the plan of the adheſive out of the queſtion, as I had not ever yet tried it in ſo deſperate a caſe; but, after much loſs of time, and a complete failure of all the means that had been uſed to procure relief, the adheſive was applied, the parts ſupported by a callico bandage, and the whole leg, on account of its very inflamed and diſeaſed ſtate, kept conſtantly well wetted. His relief was immediate, his pain, which before was very great, ceaſed in a few days, and without the interruption of a day, or the confinement of an hour, he gradually amended till the whole was ſkinned over, which happened in about four months after the new plan was adopted, and about nine after the time of his firſt application to me; during all which time he performed his part of the buſineſs of a retail ſhop in full trade.

"The very large extent of ulcerated ſurface in this caſe, together with the nature of the patient's engagements, which often prevented his regular attendance, as well as the very diſeaſed condition of the parts that ſurrounded the ulcers, will ſufficiently account for the diſproportionate length of time that was employed in the accompliſhment of this cure, which, though diſproportionate to the time that has been neceſſary to perform any other, yet ſcarcely amounted to half as many months as years had been before unavailingly employed in ſearch of relief.

CASE III. "William Preen, of Tetbury in Glouceſterſhire, aged 49, applied to me the 25th of April, 1794, with two large

ulcers on the outside of the left leg, near the middle of the peroneus longus muscle: one about three inches in length; the other, that was situated a little below, somewhat less than two inches; both were rather long than broad, and in so bad condition, that a stream of very thin offensive discharge escaped, when I removed the dressing that was upon it. He appeared very thin and emaciated, and gave the following account of himself:—That, about the age of eighteen, he fell, as he was sliding upon some ice, on the outside of his leg; that an abscess followed, which extended from his knee to his foot; that he became an in-patient to the Gloucester infirmary for it, and, after remaining there somewhat more than a year, during which time a large exfoliation had been thrown off, he was dismissed with a perfect cure; that, after some years, in consequence of an accident as he was at work in a gentleman's garden, the cicatrized part gave way, and that he could never afterwards get it healed, though he said that he had received the assistance of several eminent practitioners in that part of the county, and had been under the constant care of some surgeon the greatest part of the preceding five years; he mentioned the names of some whose reputation I was no stranger to, and added, that having tried all the old methods, his last surgeon had applied a new one, and had kept the parts constantly covered with rhubarb and other powders (according to the plan already described, as recommended by Mr. Home), with no better success than those who had preceded him: he subjoined also, that he had lived very freely, and should continue to do so; that he could not eat, therefore would drink.

"He was dressed with slips of adhesive, and the leg was firmly supported with the callico bandage. In consequence of the very irritable state of the sores, and the general inflammation of the limb, he was directed to keep the parts not only constantly wet, but also cold by the very frequent application of water poured from a large tea-pot upon the part; and, after very strict directions as to temperance, he was directed to call on me the next day; he did so, and the wounds in that short period were manifestly improved. In a few days his ulcers became healthy sores, his pain and every other inconvenient symptom left him, and by the 24th of the next month (May) he was perfectly cured; when he very candidly told me, that I had cured him in despite of himself, that he had lodged at an inn the whole time that he had been under my care, had drank freely every day, and had been intoxicated every night.

"These sores were situated in yielding parts, and to that circumstance may be ascribed a cure so speedy, under circumstances so disadvantageous. Had this person applied to me before I discovered the advantages of the method that I now use, it will be perceived that, with his licentious habits, it would not have been

in my power even to have relieved him by any of the means that were then in use; but it seems that the processes of re-union and skinning, which were both necessary in this case, could not be prevented by the irregularities of the patient, when the retracted skin was brought forward, and the other means applied which have been so often recommended.

Case IV. "Jane Powell, aged 27, a poor woman in the workhouse of the out-parish of St. Philip and Jacob, was taken under my care on the 14th of August, 1796. She had an ulcer on the outside of the left leg, partly situated on the peroneous longus muscle, and partly upon the lower external edge of the soleus; it was two inches and a half in length, two inches in breadth, and very deep; the discharge was thin and profuse, the inflammation considerable, and the described herself as suffering so much pain from it as to occasion her sitting up and giving way to tears some hours every night. She was dressed as usual with the adhesive, and the parts kept constantly cool and moist, by means of water poured very frequently upon them; in less than five weeks she was cured, with little more remaining cicatrix than would have occurred if the parts had been recently divided, and again united by the first intention. This disease had been nearly in the same state fifteen months. She had been in a hospital eighteen weeks, and had been discharged from thence without relief; her cure was now accomplished, without pain or confinement, in the before-mentioned time.

Case V. "James Gane, aged 63, a poor man in the workhouse of the out-parish of St. Philip and Jacob, had two ulcers on the outside of the right leg, exactly upon the ankle joint; one the size of a shilling, the other somewhat less; he had also two larger ulcers almost opposite to the other, on the inside of the same leg; the surfaces of these sores were on a level with the surrounding skin, the parts were much swollen and inflamed, the joint had nearly lost its mobility, and the limb appeared as if the greatest part of it had been in an ulcerated state at some former period. He said that the disease had been occasioned by the bite of a moschetto fly, at the siege of the Havannah, in the year 1762; that he had been under the care of many surgeons, and had been three times in hospitals, but that he never could obtain a serviceable cure, though it had been several times skinned over. Before I put him upon the new plan, I tried every other remedy that I was acquainted with, not excepting absolute rest in bed upwards of six months, without advancing in any degree towards a cure.

"On the 14th of August, 1796, he was first dressed with the adhesive, and the parts were directed to be frequently wetted with cold water, his relief was as sudden as had been experienced in any of the preceding instances, and in five weeks he was perfectly cured.

" The furface of this man's fores being upon a level with the furrounding fkin, and the limb much hardened by inflammation, prevented my being able to cover the denuded parts with it; nevertheleſs, the fkinning proceſs was completed, and his cure ſatisfactorily accompliſhed in the period above mentioned: and thus four ill-conditioned ulcers upon a leg that had been diſeaſed upwards of thirty-four years were cured for this poor man (whoſe age was very unfavourable) in the ſhort ſpace of five weeks. On account of his appearing much older than he really was, and his being much emaciated, I did not think proper to eſtabliſh any ſubſtituted diſcharge; yet at this day, Jan. 27, his leg continues perfectly ſound, and he is in much better health than he was before his cure was accompliſhed.

Case VI. " John Pontin, of the pariſh of St. George, in the county of Glouceſter, aged 55, was taken under my care on the 25th of October, 1796. About eighteen years ſince, as he was riding a ſpirited horſe which he was unable to manage, from the circumſtance of having loſt one of his arms ſome years before, by the burſting of a gun, it happened that, as the horſe paſſed ſwiftly by the ſide of a cart, the calf of his leg was caught by the hook of the cart, and the whole of it torn away. He was immediately taken to the Briſtol infirmary, and placed under the care of a gentleman, whoſe patients I dreſſed at that time, being then an apprentice at the houſe. A dangerous mortification ſucceeded to the injury, and it was not without difficulty that his life was preſerved. He remained in the hoſpital thirty-ſeven weeks, and was confined to his bed twenty-ſeven: at the expiration of the former period, he was diſmiſſed, with a large ulcer, on account of ſome irregularity in his conduct. It continued to embitter his life from that time to the day he was taken under my care. I then meaſured it; it was ſix inches and a half in length, and five and a half in breadth; it occupied the part that had formerly been covered by the gaſtrocnemius externus muſcle; the edges were nearly a quarter of an inch thick; the diſcharge, which was very thin and offenſive, fell in a large ſtream when I removed his dreſſings; the contraction of the tendons was ſo great, that he could only touch the ground with the points of his toes, and the limb was ſo generally diſeaſed and hardened by inflammation, as to make it apparent that any attempts to bring forward the ſkin muſt prove abortive. His pain was ſo diſtreſſing, that he could neither eat nor ſleep, and his health was ſo much affected, that he appeared very much emaciated. I did not, however, under all theſe diſcouraging circumſtances, deſpair of being able to cure him, as my almoſt uninterrupted ſucceſs had given me the greateſt confidence in the plan that I have deſcribed. On that day the adheſive ſlips were applied, and rather forcible endeavours made to bring the ſides of the ulcer nearer together, by drawing the ends of the

ſlips over it, and ſecuring them when ſo drawn. The limb was then defended with ſoft callico, and firmly ſupported with a bandage of the ſame, and the patient directed to keep it conſtantly cool by means of water. His relief was as ſpeedy and remarkable as had been obſerved in any inſtance; in three or four days the callous edges were levelled with the ſurface of the ulcer; the diſcharge was rendered inoffenſive, and healthy as that of an iſſue, and the ſkinning proceſs commenced; from that time to the preſent his cure has uniformly advanced; and, in two or three weeks, his wound, which became an inch and a half long, and about half an inch wide, was afterwards perfectly healed.

"I have the ſatisfaction to add, that the limb is become almoſt as ſoft and healthy as it ever was; and that, in conſequence of the daily application of warm animal oil to the contracted muſcles and tendons, he is now enabled to tread much more plainly upon his foot, and to walk ſome miles every day with eaſe and convenience."

After theſe evidences in favour of his new method, Mr. Baynton, with reaſon, aſks, "Does not the hiſtory of this dreadful diſeaſe afford reaſon to hope that few will hereafter be found that may not be eaſily cured by a proper application of theſe means?"

After the extraordinary ſucceſs which attended the mode of practice recommended by Mr. Baynton, we ſhould not do juſtice either to the author's ingenuity, or to the expectations of our readers, were we not to enter at ſome length into his reaſoning upon them.

It was thought neceſſary to direct thoſe perſons who had been cured by this method, to keep their legs carefully ſupported by ſuitable bandages ſome months after the cures were accompliſhed, or till the part ſeemed to afford proof of the returning veſſels having recovered their tone.

The firſt, third, and fourth caſes prove, that old deep ulcers, ſituated in yielding parts, may, by theſe means, have their ſides brought into contact, and be cured almoſt as readily by the *ſecond intention* as recent wounds, with very little remaining ſcar, and, conſequently, with a diminiſhed probability of a relapſe. The ſecond, fifth, and ſixth caſes go much farther than the preceding, for they eſtabliſh the ſuperiority of this method over every other that has been yet known, and they prove that ſpeedy cures may be obtained in the worſt and oldeſt ulcers of the poor, even where the true ſkin cannot be brought forwards, ſo as in any degree to cover the parts.

Mr. Baynton ſays, "The advantages that belong to the true ſkin can never be communicated to that which is formed in its ſtead, yet as the caſes of this kind that have been cured by theſe means have moſtly remained ſound, and thoſe that have yielded have not ulcerated in that rapid way that new-formed parts are

apt to do, but have been healed again almoſt immediately upon the re-application of the ſame means; the danger of a relapſe will be leſſened even in *theſe caſes*, as the *vaſcularity* of the new-formed parts, upon which the ulcerative proceſs much depends, muſt be leſs in caſes that are treated in this manner, than it is in parts that have been healed by the common methods of cure."

The author, adverting to an obſervation in the beginning of his work, where he ſays he was induced to apply the adheſive ſlips under the hope of bringing the retracted edges of the divided ſkin nearer together, and by the expectation of other advantages that have been found to attend this practice, adds, that "it muſt be perceived in the caſes of Harris, Gane, and Pontin, whoſe ulcers were ſo extenſive, and whoſe limbs were ſo *hardened* by the effects of long-continued inflammation, that no care or ſkill could have ever brought the diſeaſed ſkin that remained on their limbs, to cover wounds ſo extenſive. Nevertheleſs," continues he, "it appears that their cures were accompliſhed almoſt as ſoon, in proportion to the extent of their ulcers, as any of the others that are related, whoſe diſeaſes were ſituated in yielding parts, and who, for that reaſon, ſeemed ſo much more likely to be relieved by theſe means. To what circumſtance, then, are we to aſcribe theſe remarkable facts? they cannot ſurely be referred to the ingredients of the adheſive plaſter, to the effects of bandage, to the exerciſe that was uſed, nor to any conſtitutional interference, as the ſame effects have always followed the application of theſe principles, whether the patients have been young or old, robuſt or emaciated, temperate or diſorderly; whilſt ointments, compoſed of the ſame ingredients as the adheſive plaſter, bandages, exerciſe, and all the means, except the *endeavour to bring the divided parts nearer together*, to which it may be ſuppoſed the cures can be attributed, had been tried in every way, by different practitioners, in moſt of theſe caſes, and many times by myſelf, without any ſuch advantages being obtained. To anſwer this queſtion, it will be neceſſary to take a view of the proceſs of nature, in accompliſhing the cure of divided parts, as deſcribed by that accurate obſerver of the phenomena of animal life, whoſe opinions I have ſo often quoted, as well as the appearances that have been obſerved by others, in the diſſection of parts that had been divided, and that were afterwards healed*: in ſo doing, I think it will be diſcovered

* Thus, after the cure of a ſtump, every veſſel, even the largeſt, is almoſt entirely obliterated for a conſiderable extent; at laſt, both [illegible] found to remain of them but the thin membranes that compoſed their coats, which ſhrink into very ſmall inconſiderable cords: the fibres of the different muſcles are, in the ſame manner, greatly diminiſhed, and the cellular ſubſtance ſeems frequently to be almoſt entirely annihilated. Several opportunities have occurred for diſſecting the ſtumps of patients after death, and the appearances were uniformly as above related.—*Bell's Treatiſe on the Theory and Management of Ulcers*, p. 162.

that a great part of the advantages that have been obtained by this practice, and that may in future be expected to follow its adoption, will be found to depend upon an imitation of nature's proceſs, in that mechanical contraction of the granulations, which is a conſequence of the application of the adheſive, in the way that has been recommended."

Our author here quotes Mr. J. Hunter, whoſe obſervations, not only on granulations, but alſo on the ſubjects immediately connected with it, we ſhall here inſert.

"Granulations," he ſays, "are an accretion of animal matter upon the wounded or expoſed ſurface; they are formed by an exudation of the coagulating lymph from the veſſels, into which new ſubſtance both the old veſſels very probably extend, and alſo entirely new ones form, ſo that the granulations come to be very vaſcular, and indeed they are more ſo than almoſt any other animal ſubſtance.

"I have often been able," ſays he, "to trace the growth and vaſcularity of this new ſubſtance. I have ſeen upon a ſore a white ſubſtance, exactly ſimilar, in every viſible reſpect, to coagulating lymph. I have not attempted to wipe it off, and the next day of dreſſing I have found this very ſubſtance vaſcular, for, by wiping or touching it with a probe, it has bled freely. I have obſerved the ſame appearance on the ſurface of a bone that has been laid bare. I once ſcraped off ſome of the external ſurface of a bone of the foot, to ſee if the ſurface would granulate. I remarked, the following day, that the ſurface of the bone was covered with a whitiſh ſubſtance, having a tinge of blue; when I paſſed my probe into it, I did not feel the bone bare, but only its reſiſtance. I conceived this ſubſtance to be coagulating lymph thrown out from inflammation, and that it would be forced off when ſuppuration came on; but on the ſucceeding day I found it vaſcular, and appearing like healthy granulations.

"The veſſels of granulations paſs from the original parts, whatever theſe are, to the baſis of the granulations; from thence towards their external ſurface, in pretty regular parallel lines, and would almoſt appear to terminate there.

"The ſurface of this new ſubſtance, or granulations, continues to have the ſame diſpoſition for the ſecretion of pus, as the parts from which they were produced; it is, therefore, reaſonable to ſuppoſe, that the nature of the veſſels does not alter by forming the granulations, but that they were completely changed for the purpoſe before the granulations began to form, and that theſe granulations are a conſequence of a change then produced upon them.

"Their ſurfaces are very convex, the reverſe of ulceration, having a great many points, or ſmall eminences, ſo as to appear

rough; and the ſmaller theſe points are, the more healthy we find the granulations.

"The colour of healthy granulations is a deep florid red, which would make us ſuſpect that the colour was principally owing to the arterial blood; but it only ſhews a briſk circulation in them, the blood not having time to become dark.

"When naturally of a livid red, they are commonly unhealthy, and ſhew a languid circulation, which appearance often comes on in granulations of the limbs, from the poſition of the body." As an evidence of this Mr. Hunter relates the following caſe:

"A ſtout healthy young man had his leg conſiderably torn, and it formed a broad ſore; when healing, it was ſome days of a florid red, and on others of a purple hue: wondering what this could be owing to, he told me, when he ſtood for a few minutes it always changed from the ſcarlet to the modena. I made him ſtand up, and found it ſoon changed; this plainly ſhews, that theſe new-formed veſſels were not able to ſupport the increaſed column of blood, and to act upon it, which proves that a ſtagnation of blood was produced, ſufficient to allow of the change in the colour, and moſt probably both in the arteries and veins."

"Theſe ſores," continues the author, "never heal ſo faſt as the others, whether it is occaſioned by the poſition of the body, or the nature of the ſore itſelf, but moſt frequently ſo in caſes of the laſt-mentioned kind. As the poſition of the body is capable of producing ſuch an effect, it ſhews us the reaſon why ſore legs are ſo backward in healing, when the perſon is allowed to ſtand or walk.

"Granulations, when healthy, and on an expoſed or flat ſurface, riſe nearly even with the ſurface of the ſurrounding ſkin, and often a little higher, and in this ſtate they are always of a florid red; but when they exceed this, and take on a growing diſpoſition, they are then unhealthy, become ſoft and ſpongy, and without any diſpoſition to ſkin. Granulations are always of the ſame diſpoſition with the parts upon which they are formed, and take on the ſame mode of action: if it is a diſeaſed part, they are diſeaſed; and if the diſeaſe is of any ſpecific kind, they are alſo of the ſame kind, and, of courſe, produce matter of the ſame kind, which I obſerved when on pus.

"Granulations have the diſpoſition to unite with one another when ſound or healthy; the great intention of which is, to produce the union of parts ſomewhat ſimilar to that by the firſt intention, or the adheſive inflammation, although poſſibly not by the ſame means.

"The granulations having a diſpoſition to unite with each other upon coming into contact, without the appearance of any intermediate ſubſtance, perhaps is in the following manner: When

two found granulations approach together, the mouths of the fecreting veffels of the one coming to oppofe the mouths of fimilar veffels of the other, they are ftimulated into action, which is mutual; fo that a kind of fympathetic attraction takes place; and as they are folids, the attraction of cohefion is eftablifhed between them: this has been termed inofculation. The veffels thus joined are altered from fecreting to circulating; or it may be in this way, viz. the circulatory veffels come to open upon the furface, and there unite with one another, and the two become one fubftance; or it may be afked, do they throw out coagulating lymph, when they come into contact, and have a difpofition to heal? and does this become vafcular, in which the veffels may inofculate, fimilar to union by the firft or fecond intention?"

Mr. Hunter here fpeaks of two granulations on the head, which fell under his obfervation, viz. one from the dura mater (after trepanning), and the other from the fcalp: thefe united over the intervening bare bone fo ftrongly, in twenty-four hours, that it was not without confiderable force that they could be feparated, and when feparated they bled.

"The inner furface of the cutis in an abfcefs, or fore," continues he, "does not only not readily granulate, as has been mentioned, but it does not readily unite with the granulations underneath. The final intention of both feems to be, that the mouth of a fore, which is feldom fo much in a difeafed ftate, fhould have a natural principle which attends difeafe, to put it upon a footing with the difeafe which is underneath; therefore, when abfceffes are allowed to become as thin as poffible before they are opened, this proportion between the found fkin and the difeafe is better preferved, and the parts are not fo apt to turn fiftulous.

"When the parts are unfound, and, of courfe, the granulations formed upon them unfound, we have not this difpofition for union, but a fmooth furface is formed fomewhat fimilar to many natural internal furfaces of the body, and fuch as have no tendency to granulate; which continues to fecrete a matter expreffive of the fore which it lubricates, and in fome meafure prevents the union of the granulations. I imagine, for inftance, that the internal furface of a fiftulous ulcer is, in fome degree, fimilar to the inner furface of the urethra, when it is forming the difcharge commonly called a gleet. Such fores have, therefore, no difpofition in their granulations to unite, and nothing can produce an union between them, but altering the difpofition of thefe granulations, by exciting a confiderable inflammation, and probably ulceration, fo as to form new granulations, and by thefe means give them a chance of falling into a found ftate.

"Granulations are not endowed with the fame powers as parts originally formed. In this refpect they are fimilar to all new-formed parts, and it is from this caufe that changes for the worfe

are fo eafily effected. They more readily fall into ulceration and mortification, than originally formed parts; and, from their readinefs to ulcerate, they feparate floughs more quickly.

"The granulations not only fhew the ftate of the part in which they are formed, or the ftate in which they are themfelves, but they fhew how far the conftitution is affected by many difeafes. The chief of thofe habits which affect the granulations in conſequence of the conſtitution, are, I believe, the indolent and irritable habits, but principally fevers; and thefe muft be fuch as produce univerſal irritation in the conſtitution.

"The unſound appearances of the granulations fhew to what a ſtand the animal powers are put on fuch occafions, which does not appear fo vifibly in the originally formed parts; it is therefore evident, that the powers of the granulations are much weaker then thofe of the original parts."

Mr. Hunter obſerves, that we often find granulations in a fore dying without any viſible cauſe, becoming all at once livid, loſing their life, and immediately floughing off; or, in fome cafes, ulceration only in part taking place, and both together deſtroying the granulations, which are renewed and deſtroyed ſucceſſively. To counteract this, Mr. Hunter tried various modes of treatment, both local and conſtitutional, but without ſucceſs.

"It would appear," fays he, "from what has been ſaid of ſuppuration and granulations, that it is abſolutely neceſſary they ſhould take place in wounds which are not allowed to unite by the firſt intention, before union and cicatrization can take place. Although this in general is the caſe, yet in ſmall wounds, ſuch as conſiderable ſcratches, or where there is a piece of ſkin rubbed off, we find that, by the blood being ſuffered to coagulate upon the ſore, and form a ſcab, which is allowed to remain, the ſore will only be attended by the adheſive inflammation, and will ſkin over without ever ſuppurating; where a ſmall cauſtic has been applied, we find alſo, by allowing the ſlough to dry or ſcab, that when this is completed the ſcab will drop off, and the parts ſhall be ſkinned; but if the blood has not been allowed to coagulate and dry, or the ſlough has been kept moiſt, the ſore will ſuppurate and granulate.

"We even ſee in ſmall ſores, which are perfectly healthy and ſuppurating, that if the matter be allowed to dry upon them, the ſuppuration will ſtop, and the ſkin form under the ſcab."

Preparatory to the cicatrization of a wound is the contraction of the granulations. This proceſs takes place in every point, though principally from edge to edge, the circumference of the ſore then advancing towards the centre, and the ſore becoming ſmaller, even though there is little or no new ſkin produced.

"The contracting tendency," ſays Mr. Hunter, "is, in ſome degree, proportioned to the general healing diſpoſition of the ſore, and the looſeneſs of the parts on which they are formed; for,

when it has not a tendency to ſkin, the granulations do not ſo readily contract, and, therefore, contracting and ſkinning are probably effects of one cauſe. The granulations too being formed upon a pretty fixed ſurface, which is a conſequence of inflammation, are, in ſome degree, retarded in their contraction from this cauſe; but, probably, this does not act ſo much upon a mechanical principle as we at firſt might imagine; for ſuch a ſtate of parts, in ſome degree, leſſens the diſpoſition for this proceſs, but this ſtate is every day altering, and in proportion as the tumefaction ſubſides. Granulations are alſo retarded in their contraction, from a mechanical cauſe, when they are formed on parts naturally fixed, ſuch as a bone; for inſtance, on the ſcull, the bone, &c. of the ſhin, for there the granulations cannot greatly contract."

This, Mr. Hunter obſerves, ſhould induce us, in operations on theſe parts, to ſave as much ſkin as we can.

"In caſes," continues he, "where there has been a loſs of ſubſtance, making a hollow ſore, and the contraction has begun, and advanced pretty far, before the granulations have had time to riſe as high as the ſkin, in ſuch caſes the edges of the ſkin are generally drawn down, and tucked in by it, in the hollow direction of the ſurface of the ſore.

"If it is a cavity, or abſceſs, which is granulating, with only a ſmall opening, as in many that have not been freely opened, the whole circumference contracts, like the bladder of urine, till little or no cavity is left; and if any cavity is remaining, when they cannot contract any further, they unite with the oppoſite granulations, in the manner above deſcribed.

"This contraction in the granulations continues till the whole is healed, or ſkinned over; but their greateſt power is at the beginning, at leaſt their greateſt effect is at the beginning; one cauſe of which is, that the reſiſtance to their contraction in the ſurrounding parts is then leaſt.

"The contractile power can be aſſiſted by art, which is a further proof that there is a reſiſtance to be overcome.

"The art generally made uſe of is that of bandages, which tend to puſh, draw, or keep the ſkin near to the ſore which is healing; but this aſſiſtance need not be given, or is at leaſt not ſo neceſſary, till the granulations are formed, and the contractile power has taken place; however, it may not be amiſs to practiſe it from the very beginning, as, by bringing the parts near to their natural poſition, the adheſive inflammation will fix them there; they will, therefore, not recede ſo much afterwards, and there will be leſs neceſſity for the contractile powers of the granulations.

"Beſides the contractile powers of the granulations, there is alſo a ſimilar power in the ſurrounding edge of the cicatrizing ſkin, which aſſiſts the contraction of the granulations, and is generally

more conſiderable than that of the granulations themſelves, drawing the mouth of the wound together like a purſe; this is frequently ſo great, as to occaſion the ſkin to graſp the granulations which riſe above the ſurface, and is very viſible in ſugar-loaf ſtumps, where the projection of the ſore is to be conſidered as above the level of the ſkin.

"This contractile power of the ſkin is confined principally to the very edge where it is cicatrizing, and, I believe, is in thoſe very granulations which have already cicatrized; for the natural or original ſkin ſurrounding this edge does not contract, or at leaſt not nearly ſo much, as appears by its being thrown into folds and plaits, while the new ſkin is ſmooth and ſhining. This circumſtance of the original ſurrounding ſkin not having the power of contraction makes round wounds longer in healing than long ones; for it is much eaſier for the granulations and the edge of the ſkin to bring the ſides of an oblong cavity together, than the ſides of a circle, the circumference of a circle not being capable of being brought to a point.

"Whether this contraction of the granulations is owing to an approximation of all the parts by their muſcular contraction, like that of a worm, while they loſe in ſubſtance as they contract; or if they loſe without any muſcular contraction by the particles being abſorbed, ſo as to form interſtices (which I have called *interſtitial abſorption*), and the ſides afterwards fall together; is not exactly determined, and perhaps both take place."

Mr. Hunter deſcribes the uſes ariſing from the contraction of the granulations to be the following: 1. as it facilitates the healing of a ſore, two operations going on at the ſame time, viz. contraction and ſkinning; 2. as it obviates the formation of much new ſkin, an effect very evident in all ſores which are healed, more eſpecially in ſound parts.

"After the whole is ſkinned," ſays Mr. Hunter, "we find that the ſubſtance, which is the remains of the granulations on which the new ſkin is formed, ſtill continues to contract, till hardly any thing more is left than what the new ſkin ſtands upon. This is a very ſmall part, in compariſon with the firſt-formed granulations, and it in time loſes moſt of its apparent veſſels, becomes white and ligamentous; for we may obſerve, that all new-healed ſores are redder than the common ſkin, but in time they become much whiter.

"As the granulations contract, the ſurrounding old ſkin is ſtretched to cover the part which had been deprived of ſkin, and this is at firſt little more than bringing the ſkin to its old poſition, which had receded when the breach was firſt made; but afterwards it becomes conſiderably more, ſo as to ſtretch, or oblige the old ſkin to elongate."

Mr. Hunter here aſks, "Does the ſurrounding ſkin in the heal-

ing of a ſore lengthen by growth, or does it lengthen by ſtretching only? He inclines to think the former is moſt probable, and if ſo, he would call this proceſs *interſtitial growth*, particularly as it is an effect oppoſite to interſtitial abſorption."

On the proceſs of *ſkinning*, the nature of the *new cutis* and *cuticle*, Mr. Hunter preſents us with the following ingenious ideas. After deſcribing the well-known appearance of a ſore when it begins to heal, he ſays, "Skin is a very different ſubſtance, with reſpect to texture, from the granulations upon which it is formed; but whether it is an addition of new matter, viz. a new-formed ſubſtance upon the granulations being produced by them, or a change in the ſurface of the granulations themſelves, is not eaſily determined. In either caſe, however, a change muſt take place in the diſpoſition of the veſſels, either to alter the ſtructure of the granulations, or to form new parts upon them.

"One would at firſt be inclined to the former of theſe opinions, as we have a clearer idea of the formation of a new ſubſtance, than ſuch an alteration in the old. We find the new ſkin moſt commonly taking its riſe from the ſurrounding old ſkin, as if elongated from it; but this is not always the caſe. In very large ſores, but principally old ulcers, where the edges of the ſurrounding ſkin have but little tendency to contract, or the cellular membrane underneath to yield, as well as the old ſkin having but little diſpoſition to ſkinning in itſelf, a cicatrizing diſpoſition cannot be communicated from it to the neareſt granulations by continued ſympathy. In ſuch caſes new ſkin forms in different parts of the ulcer, ſtanding on the ſurface of the granulations, like little iſlands. This, I believe, never takes place in parts the firſt time of their being ſore, nor in ſores which have a ſtrong propenſity to ſkin."

Mr. Hunter deſcribes ſkinning as a proceſs ſomewhat like *cryſtallization*, ſince it requires a point or ſurface to ſhoot from, and the ſurrounding edges of the ſkin appear to preſent this ſurface of attachment.

"Whatever change the granulations undergo to form ſkin," ſays Mr. Hunter, "they may in general be ſaid to be guided to it by the ſurrounding ſkin, which gives this diſpoſition to the ſurface of the adjoining granulations; as adjacent bones give an oſſifying diſpoſition to the granulations that are formed upon them. This may ariſe from ſympathy; and if it does, I ſhould call it continued ſympathy. But when the old ſkin is unſound, and not able to communicate this diſpoſition, then the granulations ſometimes of themſelves acquire it, and new ſkin begins to form where the diſpoſition is ſtrongeſt in them, ſo that the granulations may be ready to form new ſkin, if the ſurrounding ſkin be not in a condition to give the diſpoſition. It would appear, however, that the circumference of the ſore generally has the ſtrongeſt diſpoſition to ſkin, even although the ſurrounding ſkin does not aſſiſt; for in many

old fores no new ſkin ſhall ſhoot from the ſurrounding ſkin, or be continued, as it were, from the old; and yet a circle of new ſkin ſhall form, making a circle within the old, and, as it were, detached from it.

"Skinning is a proceſs in which nature is always a great economiſt, without a ſingle exception: this, however, may probably ariſe from the granulations being always of the nature of the parts on which they are formed, and from ſeldom being formed on parts that are the leaſt of the nature of the ſkin, they have therefore no ſtrong diſpoſition to form ſkin. What would ſeem to make this obſervation more probable, is, that if the cutis is only in part deſtroyed, as by a hurt, or cauſtic, which has not gone quite through the cutis to the cellular membrane underneath, a new cutis will form immediately on the granulations, and in many caſes it will form as faſt as the ſlough will ſeparate; the reaſon is, becauſe the cutis has a ſtronger tendency to form cutis than any other part, and in many caſes it may be ſaid to form it from almoſt every point.

"We never find that the new-formed ſkin is ſo large as the ſore was, on which it is formed; this, I have already obſerved, is brought about by the contraction of the granulation, which in ſome meaſure is in proportion to the quantity of ſurrounding old ſkin, attended with the leaſt reſiſtance.

"If the ſore is in a part where the ſurrounding ſkin is looſe, as in the ſcrotum, then the contractile power of the granulations being not at all prevented, but allowed full ſcope, a very little new ſkin is formed; whereas, if the ſore is on any other part, where the ſkin is not looſe, ſuch as the ſcalp, ſhin-bone, &c. in that caſe, the new ſkin is nearly as large as the ſore.

"This we find to be the caſe alſo in parts which are ſo ſwelled as to render the ſkin tight, ſuch as the ſcrotum, when under the diſtenſion of a hydrocele, and which ſometimes happens where a cauſtic has proved ineffectual; we then find the new ſkin as extenſive as in any other parts equally diſtended. The ſame thing takes place in white ſwellings of the joint of the knee; for if a ſore is made upon ſuch a part, as is frequently done by application of cauſtics, we find that the new ſkin is nearly of the ſame ſize as the original ſore. The general principle is alſo very obſervable after amputations of the limbs; for if much old ſkin has been ſaved, we find the cicatrix ſmall, while on the other hand, if ſuch care has not been taken, the cicatrix is proportionably large.

"The new ſkin is at firſt commonly on the ſame level with the old, and if there has not been much loſs of ſubſtance, or the diſeaſe is not very deep ſeated, it continues its poſition; but this does not appear to be the caſe with ſcalds and burns, for they frequently heal with a cicatrix, higher than the ſkin, although the

granulations have been kept even with the ſkin. It would appear in theſe caſes that the tumefactions of the parts, which were the granulations, take place after cicatrization.

"Sometimes granulations cicatrize while higher than the common ſurrounding ſkin, but then they are ſuch as have been long in that poſition, as is the caſe in ſome iſſues: I have ſeen the granulations ſurrounding a pea riſe conſiderably above the ſkin, near half-a-crown in breadth, and ſkin over, all but the hole in which the pea lay, the whole looking like a tumor."

When treating on the nature of the new cutis, Mr. Hunter deſcribes the inconveniences ariſing from its neither being ſo yielding nor ſo elaſtic as is needful, and alſo leſs moveable upon the part to which it is attached. "This laſt circumſtance," he ſays, "is owing to its baſis being granulations, which are in ſome degree fixed upon parts united by the adheſive inflammation; and more particularly ſo, when the granulations ariſe from a fixed part, ſuch as a bone; the new ſkin formed upon them being alſo fixed in proportion.

"It is, however, conſtantly becoming more and more flexible itſelf, and likewiſe more looſely attached, owing to the mechanical motion to which the parts are ſubject afterwards. The more flexible and looſe the parts become, it is ſo much the better, as flexibility, or the yielding of the parts, preſerves it from the effects of many accidents. Parts which have been thickened in conſequence of inflammation, ſuch as the ſurrounding parts of new ſkin, have always a leſs internal power of action in them, than parts which have never been inflamed. This ariſes from the adventitious ſubſtance thrown out in the time of inflammation, being a clog upon the operations of the original; and the new matter not being endowed with the ſame powers, the part affected, taken as a whole, is by theſe means conſiderably weakened.

"Motion given to the part ſo affected," ſays the author, "muſt be mechanical; but that motion becomes a ſtimulant to the parts moved, that they cannot exiſt under ſuch motion without adapting the ſtructure of the parts to it, and this ſets the abſorbents to work, or they receive the ſtimulus of neceſſity, and abſorb all the adventitious or rather ſuperfluous ſubſtance; by which means the parts are as much as poſſible reduced to their original texture.

"Medicines have not the power we could wiſh in many ſuch caſes; mercury, however, appears to have the power of producing a ſimilar ſtimulus to motion, and ſhould be made uſe of where a mechanical ſtimulus cannot be applied; and, I believe, when joined with camphire, its powers of producing abſorption are increaſed: when both medicine and mechanical means can be uſed, ſo much the more benefit will enſue.

"When every thing elſe fails, *electricity* might be tried. It has

been the cauſe of abſorption of tumors. It has reduced the ſwellings of many joints in conſequence of ſprains, and thereby allowed them freedom of motion.

"The new-formed cutis is at firſt very thin and extremely tender, but afterwards becomes firmer and thicker: it is a ſmooth continued ſkin, not formed with thoſe inſenſible indentations which are obſerved in the natural or original ſkin, and by which the original admits of any diſtenſion the cellular membrane will allow of, as is experienced in many dropſies, white ſwellings in the joints, &c. This is proved by keeping a piece of dead ſkin, with a cicatrix in it, in water, to make the cuticle ſeparate from the cutis; there we find that the new-formed cuticle becomes but a little larger by ſuch a proceſs, which plainly ſhews, that the new formed cutis upon which this cuticle was formed, has a pretty ſmooth continued ſurface, and not that ſoft unequal ſurface which diſtinguiſhes the original cutis.

"This new cutis, and indeed all the ſubſtance which had been formerly granulations, is not nearly ſo ſtrong, nor endowed with ſuch laſting and proper actions, as the originally formed parts. The living principle itſelf is alſo not nearly ſo active; for when an old ſore once breaks out, it continues to yield till almoſt the whole of the new-formed matter has been abſorbed or mortified; as has been already explained.

"The young cutis is extremely full of veſſels, which afterwards, in a great meaſure, either becomes lymphatic or impervious, or are taken into the conſtitution, ſo that the ſkin and granulations underneath are at laſt free from viſible veſſels, and become white.

"The ſurrounding original cutis, being drawn towards a centre by the contraction of granulations, to avoid as much as poſſible the formation of new ſkin, is thrown into looſe folds, while the new looks like a piece of ſkin upon the ſtretch, and the whole appears as if a piece of ſkin had been ſewed into a hole by much too large for it; and therefore it had been neceſſary to throw the ſurrounding old ſkin into folds, or gather the ſurrounding ſkin, in order to bring it in contact with the new. The new cutis of a ſore, I believe, never acquires a muſcular ſtructure; nor does it grow larger than the ſore which it covers, ſo as to be thrown into wrinkles ſimilar to the old; and therefore has always that ſtretched, ſhining appearance."

On the new cuticle, Mr. Hunter makes the following obſervations, which, though conciſe, are very much in point. "It does not," ſays he, "appear to be ſo difficult a proceſs for the cutis to form cuticle, as it is for the granulations to form cutis; for we find in general, that wherever there is a new cutis formed, it is covered with a cuticle: and in caſes of bliſters, or any other cauſe which may have deprived the cutis of its cuticle, we find that the cuticle

is ſoon reſtored. We are to obſerve, however, that in ſuch caſes it is a ſound, original cutis, forming its own cuticle, and having the whole power of forming the cuticle, the ſurrounding cuticle itſelf having no power of action of this kind: every point of cutis is forming cuticle, ſo that it is forming equally every-where at once; whereas I obſerved that the formation of the cutis was principally progreſſive from the ſurrounding cutis.

"It is at firſt very thin, and partakes more of a pulpy than a horny ſubſtance; as it gets ſtronger, it becomes ſmooth and ſhining, and is much more tranſparent than original cutical, which ſhews more the colour of the rete mucoſum. This account relates to the cuticle of ſound parts which had gone through all the operations of health; but where there is a retardation in the healing, we find that the cuticle is, in ſome caſes, backward in forming, and in others it ſhall be formed very thick, ſo as to make it neceſſary to be removed, it appearing to be a clog upon the cutis, retarding the progreſs of its formation."

Of the *rete mucoſum*, Mr. Hunter ſays it is later in forming after ulceration than the cuticle, and in ſome caſes never forms at all. After bliſters, the part bliſtered remains white for ſome time after the cuticle is completely formed: and ſtill ſtronger inſtances occur in the light-coloured cicatrices we often ſee in the ſkins of the Africans.

It will be evident to the reader, that Mr. Baynton's application of Mr. Hunter's doctrine is clear and ingenious. This will appear from a compariſon of the arguments detailed already, with Mr. Baynton's further obſervations, to which we now proceed.

"If," ſays Mr. Baynton, "any thing more than the preceding quotations were neceſſary to prove that nature accompliſhes the cure of ulcerated wounds by a contraction of the granulations, and an obliteration of the extreme veſſels, the ſucceſs of the means that have been recommended in this treatiſe, I believe, would furniſh the evidence; as they only differ from the common methods of cure, inaſmuch as they tend to occaſion a contraction of the granulations, an obliteration of the veſſels, and to enable us to overcome the reſiſtance which is oppoſed to the proceſs of ſkinning. The ſame effects are produced in this method by mechanical means, that Nature is conſtantly endeavouring to produce in her operations, and ſpeedy cures have been the general conſequence of treating diſeaſes in this manner, whilſt failures have as generally occurred where the ſame kind of applications have been uſed in a different manner. Does it not then appear, that the advantages of this practice conſiſt in our being able to bring about, in a ſhorter ſpace of time, the ſame effects that the efforts of nature, when unaſſiſted by theſe means, would have imperfectly accompliſhed in a much longer period, or have failed to perform

in any time? And does not the ſpeedy contraction of the granulations, and the ſkinning that was occaſioned by endeavouring to bring the ſides of the ulcers nearer each other, in the caſes that have been deſcribed, ſufficiently account for the circumſtance of my having never loſt any of the ground that had been gained by this method of treating theſe diſeaſes? The granulations having poſſeſſed, in every inſtance that has fallen under my obſervation, ſufficient 'longevity' to enable them to complete the operations of contracting, ſkinning, and, conſequently, curing the diſeaſe, before the natural period of their decay, when they have been ſo aſſiſted; and thus it appears, that ſkinning is a conſequence of the contraction of the granulations, and that both are 'effects of one cauſe.'

"Every candid practitioner, that has ſeen many of theſe diſeaſes, muſt ſubſcribe to the truth of thoſe beautiful and impreſſive obſervations of Mr. Hunter, that reſpect the *longevity of granulations* in old ulcers of the extremities. They will alſo, I believe, be pleaſed with the ingenuous confeſſion that occurs immediately after, of a want of ſucceſs in the endeavours that were made to prolong their life. Will it be deemed arrogant, if, with the experience of near forty ſucceſsful caſes, I venture to ſay, that cures may be generally obtained by this method of aſſiſting them in the completion of their operations (in thoſe caſes where the retracted ſkin cannot be brought forward), without its being neceſſary to increaſe the period of their duration? As the ſkinning proceſs, in caſes that have been ſo treated, has been always accompliſhed before the time of their decay.

"My partiality for a mode of practice that I believe myſelf the inventor of in theſe diſeaſes, and that I may, without vanity, ſay, has enabled me to do much good, induced me to avail myſelf of the ſupport that I think it will receive from the diſcoveries of the philoſopher, whoſe laſt work furniſhed me with the preceding extracts; and, when his deſcription of nature's proceſs in curing ulcers, and the *mode of treatment* that I have recommended, is compared with each other, and with the uniform effects that have ſucceeded to *that mode of treatment*, will it be ſuppoſed that my ſolicitude to connect this improvement with his name has miſled my judgment? or rather, will it be eaſy to account in a more rational, or ſatisfactory manner for the effects that have been ſo conſtantly obſerved to follow a ſimilar cauſe to that which, he ſays, Nature employs to accompliſh her cures? If it were neceſſary to add more to render it probable that my ſucceſſes depended upon the aſſigned cauſes, it would be effectually done, by a review of almoſt every line that has been written by him upon the ſubject in the work alluded to; but, as I conſider the coincidence between his opinions and this practice to be ſelf-evident, I ſhall only add, that they mutually tend to ſupport and illuſtrate each other.

" It will ſcarcely be expected, that I ſhould think it neceſſary to notice the exploded doctrine of humours in the preſent day; but, as it has been remarked 'that thoſe notions, which have been long rejected by medical men, continue current with others a conſiderable time afterwards, to the great detriment of themſelves, and the vexation of thoſe who are called in to cure them when they are ill;' and, as it is probable that theſe ſheets may be read by perſons not of the profeſſion, who may labour under ſuch diſeaſes, and who may ſuppoſe that the diſcharges of ulcers are kept up by conſtitutional affections, or bad humours, it may render this eſſay more uſeful, if I ſay a few words on the fallacy of ſuch opinions; though the ſubject has been already ſo ably diſcuſſed, and the error ſo completely expoſed, by Mr. Bell, in his treatiſe on the theory and management of ulcers, that little remains to be added to what has been eſtabliſhed by him in the work alluded to.

" It is now known that the diſcharges of ulcers are nothing more than certain parts of the blood, ſomewhat altered in their properties by the action of the veſſels that ſecrete them. It is alſo known, that no analyſis of the blood ever detected the ſmalleſt particle of thoſe acrid fluids that are ſometimes afforded by ulcers. And when it is conſidered that a wound, furniſhing the healthieſt matter, may be made to produce the moſt acrid by a ſtimulating application, and that the acrid diſcharge may be again rendered healthy by mild applications, in a very few hours, it will be perceived that the nature of the diſcharge muſt ſolely depend on the action of the ſecreting veſſels.

" The powers of thoſe veſſels are ſo aſtoniſhingly diverſified, as to enable them to produce not only the different fluids that are neceſſary in the animal economy, the diſcharges of wounds, &c. but they are alſo capable of altering their natural actions, and producing even horn, hair, wool, and many other ſubſtances, where no human ſagacity could have previouſly ſuſpected their exiſtence.

" Dr. Cullen ſays, 'that the action of the veſſels has a conſiderable ſhare in determining both the quantity and quality of the ſecreted fluid, and that both are very little affected by the general ſtate of the circulation, or by the different conditions of the maſs of blood.' Mr. Bell ſays, 'that very little conſideration, indeed, will make it appear that no ſuch kind of matter as that which is frequently obſerved to flow from ulcers, ever ſubſiſted in the blood; and that it is not eaſy to ſuppoſe life to continue in a frame ſo delicate as the human, with its veſſels, which are ſo tender and irritable, filled with any ſort of fluid, in its nature much more acrid than what, in general, the blood in a ſtate of health is obſerved to be.'

" And it is now the opinion of the moſt enlightened practitioners, that the evils which have been ſometimes obſerved to

follow the ſuppreſſion of an accuſtomed evacuation, depend ſolely upon 'the returning of a portion of fluids into the circulation, that the animal economy had been in the habit of making a proviſion for.' Does it not then appear, that drains from ſetons or iſſues, in convenient ſituations, may, at all times, be rendered agreeable, as well as adequate ſubſtitutes, for the diſcharges that are afforded by ulcers, ſituated either upon tendinous parts, in the vicinity of joints, or upon places not ſo ſuſceptible of pain and inflammation, but that may be liable, in their progreſs, to injure the conſtitution, or endanger the lives, of the perſons who are unfortunately ſubject to them? And does it not ſeem to be a duty almoſt equal to that of ſelf-preſervation, to endeavour to obtain cures for diſeaſes, that, in their mildeſt forms, are diſtreſſing, and that in their advanced ſtages are frequently attended with danger?

"Perhaps enough has been ſaid," continues Mr. Baynton, "to convince readers who are not of the medical profeſſion, that the doctrine of humours has been rejected in conſequence of the advancement of natural knowledge, and that the opinions which have been adopted in its ſtead explain more rationally, as well as more ſatisfactorily, thoſe phenomena which were ſuppoſed to depend upon that cauſe; for ſuch perſons, and ſuch only, theſe obſervations are inſerted, with the hope of preventing, or leſſening, the oppoſition which is frequently made by them to the removal of one of the greateſt inconveniences that can be experienced, upon the groundleſs ſuppoſition that an ulcer is an outlet for the morbid materials of the body. I hope they will alſo remove from the minds of the moſt timid the objections that may be made againſt curing ſuch diſeaſes, as they prove that all the ill conſequences that can follow the ſuppreſſion of accuſtomed diſcharges may be prevented, by the eſtabliſhment of adequate drains in better ſituations.

"Much experience enables me to ſay more, and indeed to aſſert, that *many of the oldeſt ulcers have been cured without a relapſe*, or any ſucceeding conſtitutional diſeaſe, though *unaſſiſted by ſubſtituted drains.*

"It has happened, that many of the patients have been unable, from the nature of their occupations, to attend to the proper management of iſſues, and have allowed them to cloſe, ſoon after their inſertion; nevertheleſs, I have obſerved that their cures have been as laſting as thoſe have been whoſe iſſues were continued, and that they have remained, in every inſtance, as free from any conſtitutional indiſpoſition. Indeed, if the cures that were obtained by theſe means had no better ſecurity againſt relapſes than the prevention of repletion, I ſhould entertain little hope of their permanence.

"It has been obſerved, that moſt of thoſe perſons upon whom this plan has been tried have been of the claſs of labouring poor,

It may from thence be inferred, that their ſcanty diet, or their daily labour, may have prevented the bad conſequences that, in other circumſtances, might have followed the ſuppreſſion of their diſcharges. But I muſt obſerve, that though the greater number were of this deſcription, many that received perfect cures of *old ulcers*, without experiencing any diſagreeable effects, and that now remain ſound, were very differently circumſtanced.

"I may inſtance ſome of the caſes that have been deſcribed, as all that are now in this part of the world, I believe, continue ſound and perfectly healthy, though no artificial diſcharges were eſtabliſhed for either of them. Does it not then appear probable, that nature poſſeſſes the power to prevent that increaſe, or improper determination of the fluids, which has been ſo much dreaded, and which, if it occurred, might endanger?

"I merely offer the ſuggeſtions that ariſe out of the facts which have been forced upon my obſervation, by the peculiar circumſtances of thoſe people who have been cured, without ſubſtituted drains, of long-continued ulcers, without experiencing the inconveniences that might have been expected. I do not aſſert that it will at all times be ſafe to ſuppreſs old diſcharges without the eſtabliſhment of new ones; but, as I think uſeful inferences may be drawn from what has occurred in this way, it would be improper to conceal that which has really happened, though, by publiſhing it, I may appear to favour an opinion that contradicts the moſt reſpectable authorities. I venture only to ſay, that I believe the *indiſcriminate* uſe of drains to be improper, and that there may be caſes, where the patients, from the nature of their occupations, their neceſſitous ſituation, or their time of life, cannot be likely to ſuffer from repletion, and, conſequently, will not ſtand in need of drains that may prove troubleſome, and perhaps diſtreſſing.

"In different caſes, may not an attention to regimen, with the aſſiſtance of opening medicines, or the occaſional evacuation of a ſmall quantity of blood, be ſafely ſubſtituted for an artificial drain, which, though generally innocent, and frequently uſeful, is conſidered by ſome people to be equally objectionable with the diſeaſe, whoſe relapſe it is deſigned to prevent?"

Mr. Baynton has publiſhed about a dozen more caſes, ſelected in ſuch a way as to demonſtrate the *univerſality of application* which his method of cure admits of. To theſe are attached letters from Mr. Home; Mr. Henry and Mr. Simmons, of Mancheſter; Mr. Sandford, of Worceſter; and Mr. Shute, of Briſtol; all tending to confirm Mr. Baynton's practice, or to reply to the ill-founded objections of individuals.

We ſhall conclude what we have to offer on the important ſubject before us, with ſome extracts from Mr. Whately's late publication on the Cure of Wounds and Ulcers.

The following paſſages will unfold his principles, as well as the practice he has adopted, and ſufficiently enable the reader to judge of its merit. Speaking of preſſure, he ſays,

" The efficacy of *preſſure* in counteracting the effects of the dependent poſture, was indeed known to the father of Engliſh ſurgery; and the uſe of the laced ſtocking was recommended by him for this purpoſe; nor can there be any doubt, that the good effects of it in his hands were very manifeſt. His ideas, however, ſeem not to have been much regarded by ſucceeding ſurgeons. We find but little ſaid by the writers on ſurgery, on the effects of preſſure in the cure of ulcers on the lower extremities, previous to the appearance of Dr. Underwood's treatiſe. Yet I am aware, that there always have been practitioners who were acquainted with the importance of this mode of treatment, and have adopted it in their practice. I had, myſelf, an opportunity of ſeeing the extraordinary ſucceſs attending it, during my apprenticeſhip in the country. It is matter of fact, however, that the practice is very far from being general. Even in one of the lateſt publications on the ſubject, and this too by a ſurgeon of the firſt eminence, the effect of preſſure is not much relied upon for the cure of theſe complaints. It is indeed there ſtated, in ſeveral paſſages, not only that no benefit is derived from compreſſion in ſeveral ſpecies of theſe ulcers, but that many ulcers are rendered worſe, more painful, and more unhealthy in their appearance by its uſe (as obſerved in Mr. Home's remarks on Ulcers of the Legs). That there are certain conditions of an ulcer, which will not bear compreſſion, I have allowed, and have endeavoured to point out the proper treatment, to bring on a fit ſtate for the application of that preſſure; but that an experienced ſurgeon ſhould paſs over ſo ſlightly this moſt eſſential part of the cure, and even ſpeak of it as *frequently* injurious, is a circumſtance hardly to be attributed to any other cauſe than that of a careleſs and ineffectual application of the bandages. For my own part, having now been for twenty years conſtantly in the habit of treating a very large number of theſe caſes, I can ſpeak ſo confidently of the good effects of preſſure, properly applied, that I can venture to affirm, that he who doubts its efficacy, has never given it a fair trial.

" In the caſes which are added to this Eſſay, very little variety of dreſſing was uſed; the cure was almoſt always truſted principally to the preſſure made on the limb, under the exceptions particularly ſpecified in the work. My ſucceſs has been ſo uniform, that I cannot but be anxious to ſee this practice become eſtabliſhed, and generally followed. Nothing but a conviction, that in promoting this end, I am really doing an important ſervice to my fellow-creatures, could have induced me to appear before the tribunal of the public, conſcious as I am of my incompetency as a

writer. But may I not hope, that the plain tale of a practical man will be heard, though not told with the graces of elegant language?

"In whatever manner this attempt be received, I cannot doubt but that the practice here recommended muſt, in the end, prevail, notwithſtanding it has this great obſtacle to contend with, that ſurgeons muſt condeſcend, for the moſt part, to apply the bandages with their own hands. The clumſy and ineffectual manner in which this buſineſs is too frequently done, can never be expected to produce the deſired effect. I am certain that if the neceſſary pains be taken, according to the directions here laid down, ſuch effects will uniformly follow, as muſt convince the unprejudiced mind, that to have recourſe to the operation of tying varicoſe veins, and the application of a great variety of remedies, can be *very rarely*, moſt probably *never* neceſſary. I can ſafely declare, that all ſuch caſes as are deſcribed by Mr. Home to be cured by this operation, have readily yielded under the proper management of preſſure alone.

"Since theſe papers were preparing for the preſs," continues Mr. Whateley, "I have ſeen with pleaſure Mr. Baynton's new method of treating theſe complaints. Every thing that is there ſaid on the efficacy of his method, may be conſidered as confirming the doctrine laid down in the following pages. His mode, however, of making the preſſure with adheſive plaſter, appears to me inconvenient, and on ſeveral accounts objectionable. I have no doubt but that the proper application of compreſſes and flannel rollers, would, in every caſe recorded by him, have produced ſimilar good effects. The inſtances of ſucceſs by this method, after the ſuppoſed failure by the roller, I can only attribute to this, that the preſſure made with the plaſters was applied by his own hands, whereas that with the roller was, probably, as is uſual, ſo made that the effect intended by it could not poſſibly have been obtained. No ſurgeon, who will not be at the trouble of applying them himſelf, can be a judge of what may be effected by the proper management of the roller and compreſſes."

Mr. Whateley's work is divided into ten chapters, in which the ingenious author reſpectively treats of the difficulties attending the cure of wounds and ulcers on the legs; of the nature, treatment, and cure, peculiar to local wounds and ulcers, and ſuch as are connected with diſeaſes of the conſtitution; of eryſipelatous inflammation after wounds and ulcers of the legs; of the treatment of carious ulcers, &c.—After commenting on the different methods of curing wounds and ulcers of the legs, namely, *with* and *without reſt*; and likewiſe explaining the method of preventing relapſes; he adds *one hundred and ſixty-ſeven* ſhort caſes, all of which appear to have terminated ſucceſsfully, while the patients

were permitted to walk about, and purſue their uſual occupations.

In a note ſubjoined to theſe caſes, Mr. Whateley obſerves, "that about *one hundred and twenty* of theſe patients are *now* living, and perfectly well. About twenty of the remaining number are dead; and twenty-ſeven are removed to freſh places of abode."

For the information of thoſe readers who are not already in poſſeſſion of this uſeful book, we ſhall here inſert the formula of the calamine cerate, which the author has generally uſed, as it is not made according to the College Diſpenſatory. He obſerves, however, that this cerate is more apt to grow rancid than the common calamine cerate, and on that account is not ſo eligible for a plaſter; but, with this exception, it is a better compoſition, and leſs liable to evaporate than the latter. The following is the formula alluded to:

(No. 31.) ℞. Axung. porcin. depur. lib. iij.
Empl. Lythargyr. lib. iſs.
Lap. Calam. præp. ap. lib. j.

Mix them together according to art, into a *calamine cerate*.

"To this formula," ſays Mr. Whateley, "I ſhall add another for making a cerate, which nearly reſembles the unguentum tripharmacum of the old Diſpenſatory, but being leſs oily, it makes a much more adheſive plaſter. It ſhould be ſpread on rag, or ſilk, as an external covering to the dreſſing on lint, where a tow plaſter cannot be conveniently uſed; as in wounds of the face or hands, a bubo, or any other ſore, where an external plaſter cannot be readily retained in its ſituation by a bandage. This plaſter is likewiſe ſo mild that it never irritates the ſkin. I have found it alſo a very uſeful plaſter in fractures. The following is the formula:

(No. 32.) ℞. Empl. Litharg. lib. j.
Axung. porcin. depur. unc. vj.
Aceti unc. iv.

Mix theſe together according to art, into an ointment.

Beſides thoſe before mentioned, the author has annexed nine other "Caſes of carious ulcers on the legs," accompanied with a coloured plate, and ample explanations. Theſe caſes alſo convey much novel and intereſting matter, eſpecially relative to the *internal* exfoliation of bones, and are well deſerving the attention of every chirurgical practitioner.

We cannot conclude without making the reader acquainted with the hints and directions contained in the *Poſtſcript*, which appear to us ſo preciſe and uſeful, that we ſhall quote them in the author's own words; for the additional reaſon, as he here likewiſe replies to the objections made againſt the application of the roller, by Mr. Bayntun.

"Although," ſays Mr. Whateley, "there are many obſervations made in the body of the foregoing work reſpecting the proper method of applying the roller and compreſſes, it perhaps may not be unacceptable to the younger part of the profeſſion to add a few more particulars on ſo important a matter.

"I have ſaid, that the flannel rollers ſhould be four inches wide, to allow for ſhrinking in waſhing; by which I would have it underſtood, that when they are made of that width, they are a little too wide; eſpecially for thoſe whoſe legs are ſmall. The beſt width for a flannel roller deſigned for thoſe who have ſlender legs, is three inches; but for thoſe whoſe legs are of a large ſize, they ſhould be always three inches and a half in width. They muſt therefore be torn at firſt a little wider, that they may be of their proper width when repeatedly waſhed. It will likewiſe be found, that rollers made of fine, ſoft, and open flannel, will anſwer much better than thoſe made of coarſe or hard flannel.

"For thoſe who have full-ſized legs, the length of ſix yards is but juſt ſufficient to anſwer all the purpoſes intended by a roller; but in thoſe who have very ſmall legs, five yards is a ſufficient length. Care ſhould be taken that the rollers be waſhed in very hot water, and they ſhould be hung up to dry immediately on being waſhed. If theſe precautions be not attended to, repeated waſhing them will, in ſome kinds of flannel, make them as narrow as tape, by which they will be rendered almoſt uſeleſs. They ſhould be often waſhed, as they are much ſofter, and of courſe fit eaſier, when quite clean, than when they are ſoiled."

With reſpect to the *manner* of applying the roller, Mr. Whately is anxious to give the moſt pointed and unequivocal directions; and as we have already quoted ſome of the particulars relative to this ſubject, we think it worth while to extract the ſucceeding part of the Poſtſcript, in the words of the author; and thus enable the reader to form a juſt opinion on a ſubject of great importance in chirurgical practice.

"In applying a roller," ſays he, "the firſt circle ſhould be made *round* the *loweſt* part of the ancles as near as poſſible to the heel; the ſecond ſhould be formed from thence round the foot; the third ſhould be paſſed again round the foot quite to the toes. The roller ſhould then be paſſed from the foot round the ancles and inſtep a ſecond time, to make the fourth circle. In doing this, it ſhould be brought nearer (but not over) the point of the hee than it was at the *firſt time* of going round this part. The fifth circle ſhould paſs over the ancles again, and not more than half an inch higher up the leg than the fourth circle. The ſixth, ſeventh, eighth, and ninth circles ſhould aſcend ſpirally along the ſmall of the leg, at the *exact diſtance* of three fourths of an inch from each other. Having proceeded thus far up the leg, we may begin to increaſe the diſtances of the circles from each other;

they may ſucceed each other upward to the knee, at the diſtance of from one to two inches, according to the ſize and ſhape of the leg. At that part where the calf of the leg commences, it is generally neceſſary to let the upper edge of the roller be once, twice, or thrice, turned downwards for about half the circumference of the leg, in order to make the roller lay ſmooth between the middle of the calf, and the ſmall of the leg. When the roller has been thus applied as far as the knee, there will be a portion of it to ſpare of perhaps a yard in length; this remainder ſhould be brought down by ſpiral windings, at greater diſtances from each other than thoſe which were made on the aſcent of the roller. The windings ſhould in general be completed in the ſmall of the leg, where the roller ſhould be pinned.

" In *many* caſes it is neceſſary to apply the roller *over the heel.* It ſhould be brought as low as poſſible round the ancle; as in the former deſcription. From thence, the ſecond circle of the roller ſhould paſs from the inſtep over one ſide of the heel, and be brought over the other ſide of the heel to the inſtep again. The third circle ſhould be paſſed round the ancles a ſecond time, but ſtill nearer to the heel than the firſt circle was. The roller ſhould after this be brought back to the foot, and paſſed round it to make the fourth circle. A fifth circle ſhould be again made (though it is not in all caſes abſolutely neceſſary) round the foot, to the toes. To make the ſixth circle, the roller ſhould be brought back, and paſſed round the ancles again. The ſeventh, eighth, ninth, tenth, and eleventh circles ſhould aſcend ſpirally at the *exact diſtance* of three fourths of an inch from each other; theſe diſtances commencing at the ſixth circle. The roller ſhould then be carried to the knee, and be brought down again to the ſmall of the leg, as deſcribed in the former inſtruction.

" In applying the compreſſes, it is neceſſary in every inſtance to put them on one by one, and not all in a maſs, though they be of a proper ſize and number. They ſhould be croſſed in different directions; the largeſt of them ſhould in no caſe be longer than juſt to meet on the oppoſite ſide of the leg to which they are applied. I have in many inſtances ſeen the compreſſes applied by the patients of ſuch a length as to go round the leg like a roller, and be faſtened together with pins. This method generally wrinkles and blifters the ſkin, and by no means anſwers the purpoſe of making a compreſſion on the part where it is moſt wanted. I never ſuffer a pin to be uſed in the compreſſes. If the ſame compreſſes in any caſe be applied two days together, they ſhould always be turned on the contrary ſide at each re-application, in order to prevent wrinkles on the ſkin."

Mr. Whateley now replies to two objections made by Mr. Baynton, in the 39th page of the ſecond edition of his work. " The firſt is, that it is difficult to retain the roller on the parts

to which it is applied; the second is, that it gives pain to the patient. In answer to the first of these objections, his experience warrants him in saying, that a flannel roller will in almost every instance keep the exact position it was first placed in for much longer time than is necessary. "I have seen these rollers," says Mr. Whateley, "many hundred times keep their situations without any variation whatever for two days; and that too without the least restraint upon exercise. This has happened in those cases, where from the distance of the patient, or from the circumstance of his being nearly cured, I have wished to dress the leg only every forty-eight hours. I must go a step further, and observe, that I have seen repeated instances in which these rollers have remained in their situation for three or four days, and even nearly for a week without being applied afresh. In short, it is one of the best properties of a flannel roller, that it is easily retained in its situation, when well applied. In *every* instance in which it is necessary to use one, I could pledge myself to apply it in such a manner, as should prevent its altering its position for two days. The method I should use I have already described; in addition to which, nothing more would be necessary, even in those cases where the shape of the leg is peculiarly unfavourable to the retention of a bandage, than the insertion of a few pins.

"In answer to the second objection, I observe, that I have invariably found, that when a flannel roller has been applied in the manner here described, and has not been drawn unnecessarily tight, it gives no pain. It fits nearly as easy as a common stocking, and allows a very free motion and exercise of the limb. It has been stated in this work, that the application of the compresses makes the necessary degree of pressure on the ulcer, and thereby prevents the necessity of drawing the roller so tight over the other parts of the leg, as would have been necessary were the compresses not used.

"There is another circumstance which Mr. Baynton considers as giving his method a great advantage over the roller, which is, that by means of the plaster, the edges of the sore may be made to approximate in such a manner that the cicatrix, or new-formed skin, will be less after a cure performed by this method, than by any other. In almost all these cases, before the cure is attempted, the leg is more or less enlarged by swelling; and as this swelling is entirely removed by compression, it readily allows the skin to approximate on the healing of an ulcer. Added to this, there is a process of nature always going on in healing an ulcer or wound in any part of the body (whether there be a loss of substance or not), by which a cicatrix is always considerably less than the previous size of the sore. This effect occurs in all cases, whether the patient be cured by the horizontal position, a roller, or by strips of adhesive plaster. The size of this cicatrix will likewise

vary in different cafes where the ulcers have been of the fame fize, by whichever of thefe three methods they be cured. It will be larger in thofe ulcers which are accompanied with ftrong adhefions of the adjoining parts, than in thofe where fuch adhefions have not been produced; and this effect will take place to the greateft degree where the ulcers are fituated over the tibia, and by long continuance have produced immoveable adhefions of the cellular fubftance to the adjoining periofteum. The adhefive plafter, when applied as a bandage, will without doubt leave as fmall a cicatrix as any other method of cure; but, for the reafons already aſſigned, I do not believe that the cicatrix will in any cafe be *fmaller* than that produced by a roller. In every cafe cured by the latter method, I have found the cicatrix very fmall, when compared with the previous fize of the ulcer."

Sect. XIV. *Of* White Swellings.

There are two fpecies of white fwellings, Mr. Benjamin Bell obferves; the one of a mild nature, and frequently admitting of a cure; which the other never does. The former, named by our author the *rheumatic fpecies of white fwelling*, begins with an acute pain, feemingly diffufed over the whole joint, and frequently extending along the tendinous aponeurofes of the mufcles which communicate with it. There is, from the beginning, an uniform fwelling of the whole furrounding integuments. Great tenfion generally prevails; but at firft there is feldom any external change of colour. From the commencement of the difeafe, the motion of the joint is attended with exquifite pain, and the patient keeps it conftantly in a relaxed poſture, finding that the eaſieſt. Hence the tendons become extremely ſtiff and rigid, till at laſt the joints have the appearance of complete and real anchyloſes. The fwelling now begins to augment, till the joint has acquired three or four times it natural fize; the cuticular veins become turgid and varicofe; at the fame time, that the mufcular fubftance of the limb below decays, though it frequently acquires an equality in fize by becoming œdematous; the pain becomes intolerable, efpecially when the perfon is warm in bed, or otherwife heated; abceſſes form in different parts, which, either breaking of themfelves, or by being laid open, difcharge conſiderable quantities of matter, but without any remarkable effect in reducing the fize of the fwelling. The pus difcharged from theſe is at firſt of a tolerably good conſiſtence, but ſoon degenerates into a thin ill-conditioned ſanies. However, the orifices from whence it flows ſoon heal up, unleſs they are kept open by art; and new collections breaking out, they burſt and heal up as before; ſo that in long-continued diſorders of this kind, the ſur-

rounding integuments are often entirely covered with cicatrices.

In the mean time, the health of the patient gradually declines, from the violence of the pain, and the abſorption of matter into the ſyſtem, which takes place in ſome degree from its firſt formation in the different abſceſſes; but which never appears ſo evidently till the different abſceſſes have been laid open; after which a quick pulſe, night-ſweats, and a weakening diarrhœa, are ſure to occur, which generally carry off the patient, if the member is not either amputed, or the diſeaſe cured ſome other way.

On *diſſecting limbs* which have been amputed for white ſwellings, the original diſeaſe appears to have been a morbid thickening of the ſurrounding ligaments, without any other affection of the joint whatever; the bones and cartilages always remaining perfectly ſound, as likewiſe the ſynovia both in quantity and conſiſtence. In the more advanced ſtages of the diſorder, the thickneſs of the ligaments is more conſiderable, and is generally attended with an effuſion, into the ſurrounding cellular ſubſtance, of a thick glairy matter, which gives to ſwellings of this kind an elaſtic ſpringy feel, independent of the collections of matter the fluctuation of which may alſo be perceived. Through this glairy matter the collections of pus run in various directions, without ſeeming, however, to mix with it. In ſome inſtances, alſo, a great many ſmall hydatids are obſerved; all which form a confuſed maſs, incapable of further diſſection.

All the above-mentioned appearances have been obſerved without any affection of the bones or cartilages. But when, by a very long continuance of the diſorder, the ligaments come to be corroded by the different collections of matter, the cartilages, and in conſequence thereof the bones, ſoon begin to ſuffer. The tendons of the flexor muſcles, though very ſtiff and contracted, do not, upon diſſection, ſhew any ſigns of diſeaſe.

The above is a hiſtory of the mildeſt ſpecies of white ſwelling; the more inveterate kind our author names the *ſcrophulous white ſwelling*. In this the pain is commonly very violent; more acute than in the former; and, inſtead of being diffuſed, is confined to a particular ſpot, commonly the very middle of the joint. The ſwelling is commonly inconſiderable at firſt; inſomuch that, on ſome occaſions, even when the pain has been very violent, little difference in point of ſize could be obſerved between the diſeaſed and the ſound joint. The motion of the joint is attended with very great pain, and the tendons become ſtiff. As the diſorder advances, the pain becomes more violent, and the ſwelling increaſes, with an evident enlargement of the ends of the bones. The ſame elaſtic feel, together with ſimilar abſceſſes, occur in this as in the laſt: but upon opening them they commonly diſcharge a thin fœtid ſtuff; the bones are found to be carious, and pieces of them are frequently diſcharged at the openings.

By the continuance of the diſorder, the conſtitution ſuffers, as in the firſt ſpecies of the diſeaſe; and a diarrhœa, with night ſweats, commencing, the patient is ſoon reduced to little more than ſkin and bone.

Upon ſuch joints being *diſſected* in the firſt ſtages of the diſorder, the ſoft parts ſeem very little affected: but there is conſtantly obſerved an enlargement either of the whole ends of the bones, or of their epiphyſes; frequently of thoſe on one ſide of the joint only; in others, again, the bones on both ſides have been affected.

This enlargement ſometimes occurs without any other evident diſeaſe: but in general, and always in a more advanced ſtate of the complaint, the ſoft ſpongy parts of ſuch bones appear diſſolved into a thin, fluid, fœtid matter; and that too, in ſome caſes, without the cartilages which ſurround them ſeeming much affected. In proceſs of time the cartilages are likewiſe diſſolved; and then the matter of the bones and ſofter parts mixing together, with much ſwelling, exhibit, in that ſtate, a ſtill more confuſed collection than is generally obſerved even in the worſt ſtages of the other ſpecies of the diſorder.

In the further progreſs of this diſeaſe, the ſurrounding ſoft parts likewiſe ſuffer: the ligaments become thickened, and the contiguous cellular membrane is ſtuffed with the viſcid glairy matter obſerved in the other ſpecies of the diſorder.

We come now to the conſideration of the different cauſes which tend to produce this diſeaſe. That the ligaments of the joints only are firſt affected in this diſorder, is rendered evident by diſſection. The thick glairy effuſions into the cellular membrane are probably occaſioned by an exudation from the veſſels of thoſe ligaments that have been originally inflamed, as ſuch parts never furniſh a proper fluid for the formation of purulent matter: in the courſe of this diſeaſe, indeed, abſceſſes containing real pus always appear; but never till inflammation has been communicated to the ſurrounding parts. We may conclude, therefore, that the firſt ſpecies of white ſwelling is always occaſioned by an *inflammatory* or *rheumatic affection* of the ligaments of ſuch joints as it attacks, from whatever cauſe ſuch inflammation may originally have proceeded.

The other ſpecies of the diſorder ſeems to be originally an affection of the bones; the ſurrounding ſoft parts coming only to ſuffer in the progreſs of the diſeaſe from their connection with, and vicinity to theſe. This laſt ſpecies of white ſwelling generally begins without the patient being in the leaſt able to account for it: and from the effects which it produces on the bones attacked, appears to be a ſpecies of *ſpina ventoſa*; a diſeaſe of the bones probably of the ſame nature as ſcrophula is of the ſoft parts. Indeed, the appearances of the two diſorders, after making allow-

ance for their different ſituations, are exceedingly ſimilar: they both begin with conſiderable enlargements or ſwellings of the parts, which generally end in ulcerations; they both, likewiſe, frequently occur in the ſame perſon at the ſame time. This ſpecies of white ſwelling is generally either attended with other evident ſymptoms of ſcrophula; or the patient, in an early period of life, has been ſubject to that diſeaſe; or, which is nearly the ſame, he is deſcended from ſcrophulous parents, and probably has the ſeeds of that diſeaſe lurking in his conſtitution. From all theſe circumſtances, it may with probability be concluded, that this ſpecies of white ſwelling is of a ſcrophulous nature: and ſince the other ſpecies of the diſorder is to be conſidered as an inflammatory affection, a thorough diſtinction between them is of very great importance; it will not be improper, therefore, to give a ſhort enumeration of the ſeveral diagnoſtic or moſt characteriſtic ſymptoms of each.

The pain in the firſt ſpecies is always, from the beginning, diffuſed over the whole joint, and ſometimes extends a conſiderable way along the muſcles that are attached to it: in the other ſpecies it is always at firſt, and ſometimes even when the complaint has been of conſiderable ſtanding, confined to a very ſmall circumſcribed ſpace. In the former, the ſwelling is always confined to the ſoft parts, and is from the beginning exceedingly evident: but in the latter, it is generally for ſome time hardly perceptible; and when it appears, the bones are the parts chiefly affected, the ſurrounding teguments coming only to ſuffer on a farther progreſs of the diſeaſe. Theſe are the chief local differences of the two ſpecies of the diſorder; but ſome aſſiſtance in the diſtinction may likewiſe be obtained from the general habit of the patient, and from the manner in which the complaint may ſeem to have been produced. Thus, when ſuch ſwellings occur in young, ſtrong, plethoric people, eſpecially in ſuch as have formerly been ſubject to rheumatiſm, they moſt probably will always prove of the mildeſt of rheumatic ſpecies of the diſorder: but when they appear in patients of ſcrophulous diſpoſitions, we need be under very little doubt in concluding them to be of a ſcrophulous nature.

The great utility of properly diſtinguiſhing the two different ſpecies of white ſwellings appears in no circumſtance ſo evident as in the treatment. In the one there being ſome chance, by proper remedies, of being ſerviceable to the patient; whereas in the other, viz. the ſcrophulous, it is not probable that art will ever be able to afford much aſſiſtance.

In the rheumatic white ſwelling, as it is always at firſt evidently of an inflammatory nature, conſiderable advantages are commonly obtained by a due attention to a proper cooling courſe. The firſt remedy which, with this view, ſhould be put in practice, is

blood-letting immediately from the part affected. Cupping and ſcarifying is here a principal remedy. The inſtrument ſhould be applied to each ſide of the diſeaſed joint; on each ſide of the rotula, for inſtance, when the knee is the part affected, and at leaſt eight or ten ounces of blood diſcharged; and this to be repeated, at proper intervals, once, twice, or oftener, according to the violence of the ſymptoms, and the ſtate of the patient's ſtrength at the time.

Cupping is, in theſe caſes, much ſuperior to leeches, becauſe it is more expeditious, and becauſe the ſwelling occaſioned by the application of any conſiderable number of theſe animals proves frequently very troubleſome, and ſometimes interrupts for a time the uſe of any other remedies.

Upon the anterior part of the joint, where the cupping-glaſſes have not been placed, a ſmall bliſter ſhould be directly applied, and the part kept open with iſſue ointment, till the wounds from the ſcarificator are ſo far healed that a veſicatory may likewiſe be laid on one ſide of the joint; and ſo ſoon as that is nearly healed, the other ſide ſhould be alſo bliſtered. By thus alternately applying them, firſt to the one ſide and then to the other, almoſt a conſtant ſtimulus is kept up; which, in deep-ſeated inflammations, ſeems to have fully a greater influence than all the diſcharge occaſioned by bliſters. Gentle cooling laxatives, at proper intervals, are alſo of uſe; and the patient ſhould, in every reſpect, be kept upon a ſtrict antiphlogiſtic courſe, both as to diet and every other circumſtance.

It is in the firſt ſtages only of the diſeaſe that ſuch a courſe can be of much ſervice; and in ſuch it has frequently been a means of curing diſorders which otherwiſe might have proceeded to the laſt ſtages of white ſwelling.

The original inflammatory affection being once over, theſe ſort of drains ſeem to have little or no influence, and ought not then to be long perſiſted in, as they prevent the uſe of other remedies, which, in an advanced ſtage of the diſeaſe, are commonly more efficacious.

The inflammation being moſtly gone, and while there are yet no appearances of the formation of matter, mercury has ſometimes been found of uſe; not given ſo as to ſalivate, but merely to affect the mouth gently, and to keep it ſomewhat ſore for a few weeks.

The beſt form of uſing it is by way of unction, as it allows, at the ſame time, the application of friction; which, in all ſuch ſwellings, may of itſelf be in ſome meaſure conſidered as a remedy. For this purpoſe, an ointment of quickſilver and hogs' lard ſhould be prepared; but with ſo ſmall a portion of the former, that the patient may admit of two drachms of the ointment being rubbed in three times a-day. In order to rub that quantity of the

medicine in with gentle friction, an hour each time is at leaſt neceſſary; for in the ordinary way of continuing friction for a few minutes only, it can ſeldom have much influence.

By Le Dran, and other French writers, falls of warm water on ſwellings of this nature are much recommended; and there is no doubt, that a long-continued and reiterated application of that remedy may, in the firſt ſtage of ſuch complaints, be often attended with very good effects. By a proper uſe of theſe different applications, viz. of the ſeveral topical remedies in the firſt or inflammatory ſtate of the diſeaſe, and afterwards (ſtill, however, before the formation of matter) of mercurial frictions, &c. many affections of this nature have been entirely removed.

It frequently happens, by the bent poſition the limb has been for a long time kept in, that the uſe of the joint comes to be entirely loſt, having often acquired ſuch a degree of ſtiffneſs, that any attempts to move it are commonly attended with very great pain. This has been conſtantly attributed to one or other of two different cauſes, which are both in their nature incurable, viz. either to the ends of ſuch bones as compoſe the joints having run into one another, ſo as to become firmly conjoined in conſequence of the ſurrounding cartilages being abraded; or to the inſpiſſation, as it is termed, of the ſynovia of the joints, whereby their cavities are entirely filled up, and no ſpace left for the future motion of the bones.

Both theſe opinions, however, are in general very ill founded: as the ſtiffneſs almoſt always proceeds from a contraction of the muſcles and tendons. It may often be cured by a long-continued uſe of emollients.

The beſt emollient that can be uſed is ſoap and oil applied warm; as much of it as can be eaſily rubbed in by an hour's gentle friction ſhould be regularly done at leaſt three times a-day; and inſtead of confining the friction altogether to the rigid tendons, it ſhould be extended over the whole muſcles, even to the inſertions of their other extremities; but more eſpecially on their fleſhy muſcular parts, where the principal cauſe of the contraction in ſuch complaints is probably ſeated.

The web or omentum of a new-killed ſheep, or of any other animal, applied over all the diſeaſed parts directly on being cut out of the animal, is ſometimes attended with advantage. The application ſhould be renewed as frequently as poſſible, once a-day at leaſt, or oftener when it can be done; for on being more than four or five hours applied it becomes diſagreeable; and after that time, indeed, as it commonly grows ſtiff, it cannot then probably be of much ſervice.

The diſorder has hitherto been ſuppoſed not to be ſo far advanced as to have occaſioned the formation of matter; for when come that length, Mr. Bell aſſerts, no conſiderable advantages

can be expected from any of the remedies as yet recommended; but, even in that ſtate of the complaint, if the patient's health does not abſolutely require it, amputation of the member ſhould not be immediately had recourſe to; for, by opening the different abſceſſes ſoon after their formation, the matter may be prevented from deſtroying the capſular ligaments of the joints, which, if once effected, would, no doubt, render that operation neceſſary. Even in point of ſucceſs from the operation, it ought never to be adviſed till the complaint is pretty far advanced; for in this diſorder eſpecially, a greater proportion of patients have recovered after amputation, who have previouſly been conſiderably reduced by diarrhœa and other weakening ſymptoms, than of ſuch as have ſtill remained in a full plethoric habit of body.

All the different obſervations hitherto made upon the treatment relate particularly to the rheumatic ſpecies of the diſorder, and when had recourſe to in time, and duly perſiſted in, they will frequently be found of ſervice; but, when the diſeaſe is ſo far advanced as to have deſtroyed the capſular ligaments of the joint, and, perhaps, even the cartilages and bones themſelves, amputation of the member is then, no doubt, the only reſource.

In the ſcrophulous white ſwelling, when the diſeaſed parts of the bone begin to caſt off, a cure may, in that way, by aſſiſting the efforts of nature, be ſometimes obtained in the ſmall joints; but, in all the large joints, as the knee, ancle, &c. it is not probable that any other reſource than amputation will ever afford much relief: and even the effects of that operation can ſeldom be depended on as laſting; for, when the general ſcrophulous taint ſtill ſubſiſts in the conſtitution, the diſorder will moſt probably appear again in ſome other part; which, however, in the advanced ſtages of the diſeaſe, it is ſometimes neceſſary to run the riſk of, the pain being often ſo tormenting, as to make it more eligible to ſubmit to any hazard, rather than to bear it longer.

When, however, for ſome reaſon or other, amputation is determined againſt, as there being almoſt a certainty of the complaint ſoon returning, from the ſcrophulous diſpoſition appearing very ſtrong in the ſyſtem, it then becomes neceſſary to have recourſe to palliatives, ſo as to render the complaint as tolerable as poſſible; and with this view, opiates in large doſes, by moderating the pain and procuring reſt to the patient, will, in general, be found the principal remedy. In other reſpects, all ſuch medicines and articles of regimen as are found beneficial in ſcrophula may be had recourſe to.

To theſe obſervations of Mr. Bell we ſhall add ſome account of the method of cure propoſed by Mr. Latta; and, as nothing can be more ſerviceable to the young practitioner than the recital of facts which tend to illuſtrate the practice recommended, we ſhall alſo annex ſome of the caſes treated by the ſame gentleman.

"The white swelling," he observes, "however dangerous and obstinate, in many cases admits of a cure. An antiphlogistic regimen is proper in the rheumatic kind. Cooling purges, such as sal de rochel, crystal. tart. infus. tamarind. cum sena, may be given with success, when repeated at proper intervals. Some blood may also be taken from the diseased limb, either by means of leeches, or cupping, with scarification; though the latter is always to be preferred, where it can be used. Little advantage, however, can be expected from either, unless the quantity taken away be considerable. Ten or twelve ounces ought to be taken at a time, and the operation repeated at proper intervals, till the pain goes off entirely; and, by attending to the directions formerly given upon that subject, it will be an easy matter to obtain the quantity of blood just mentioned. If leeches are used, the number ought to be considerable, and we cannot expect a sufficient discharge from fewer than sixteen or twenty.

"In the first stage of the disease, almost all our hopes of cure rest upon performing this operation with judgment; but, even when the pain has abated considerably, which it often does, we frequently find a great degree of swelling and tension remaining, so that the completion of the cure must not be left to nature, otherwise all the bad symptoms would be apt to return on the least exertion of the patient. Rubefacients and blisters will now be found of the greatest use. Blisters may be put upon each side of the patella, and ought to be of such a size and shape as to cover the whole of the swelling on the inside, from the hinder part of the joint at the edge of the hollow of the thigh, to the edge of the patella, over the whole extent of the swelling above and below. As soon as the blister is taken off from one side, it ought to be applied to the other, and thus repeated alternately, until both swelling and pain be completely removed. When this is the case, the patient ought to be directed to rub the joint well with a liniment composed of half an ounce of camphor dissolved in two ounces of oil, with the addition of half an ounce of aqua ammoniæ puræ. This is to be used three times a-day; and in this way I have successfully treated many cases of white swelling, in two or three of which there was an evident appearance of a very large collection of fluid on each side of the patella. The patients still continue well, though the cures were performed several years ago.

Case I. "In April, 1790, W. G. a porter, aged 52, happened, when carrying a considerable load, to fall and bruise his left knee on the inside. For some days he felt but little pain; but afterwards, in walking down to Leith, the whole joint became suddenly affected with a very acute pain, which increased every moment, and, in the course of a few weeks, was attended with a very considerable swelling, which also continued to increase, until

the joint at laſt became rigid, the pain all the time ſeeming to paſs immediately through the centre of the joint. In this ſituation he continued for nearly twelve months, when I was called to him. I found his knee-joint very much ſwelled, and had an elaſtic feel, complaining of conſtant ſevere pain, which was exceedingly aggravated during the night, and he could neither bend nor extend it in the ſmalleſt degree; but, notwithſtanding the long time the diſeaſe had continued, there was no evident fluctuation. He had frequently applied leeches, and had fomented the joint with flannel wrung out of warm water; and theſe applications had been continued for a long time without any change, either in the pain or ſwelling. I ordered him to put a bliſter over the whole joint, and, after it was removed, to put a cataplaſm of bread and milk upon the place till it ſhould heal; and, as ſoon as one bliſter was healed, I deſired him to put on another in the ſame manner. By this treatment the pain and ſwelling were entirely removed in three months, and at the time of writing this he is able to follow his employment, though more than ſixteen months ſince the cure was performed.

Case II. "G. B. a ſtrong and healthy man, about thirty-ſix years of age, a currier by trade, was, one night in the month of December, 1788, after a ſevere day's labour, ſeized, while in bed, with a pain in the joint of his left elbow, which at times affected alſo the joint of the wriſt. For ſeveral days he made a ſhift to follow his buſineſs, though with a conſiderable degree of pain, but in a ſhort time was obliged to deſiſt, on account of the violent pain in his elbow, which was always greatly exaſperated in the night-time, when in bed. The pain in the wriſt was but ſlight. There was little or no appearance of ſwelling for ſome time; and, even during the firſt four weeks, the pain (which ſeemed to be confined to the centre of the joint) was often ſo violent that it made him cry out, particularly in the night-time, yet the ſwelling was but trifling, but the motion of the joint was deſtroyed by the violence of it, and rigidity of the tendons. In this miſerable ſtate he continued till the month of March, 1789, having, during all that time, conſulted no medical perſon, but attempted to relieve himſelf, by the advice of his neighbours, by the application of leeches, ſpirit of wine and camphor, ſtrong ardent ſpirits, neats-foot oil, and putting upon the pained joint the warm omentum of a ſheep newly killed, but without any relief.

"On the 10th of March, 1789, I firſt ſaw him, and found the joint greatly ſwelled, with an elaſtic feel, but no perceptible fluctuation. He complained of moſt exquiſite pain upon every attempt to bend the joint, but in other reſpects his health was good. I directed him to have recourſe once more to the leeches, but to put on twenty, inſtead of ſix at once, and to encourage the flux of blood, by immerſing the joint in a large baſon of warm

water, as hot as he could bear it, and to be renewed as often as it ſhould cool. Next morning I ordered him a mercurial purge of three grains of calomel rubbed with fifteen grains of cream of tartar. After the bleeding was ſtopped, the arm was ordered to be well wrapped up in flannel.

" 12th, The wounds from the leeches had diſcharged a great quantity of blood, and the laxative had operated well. For the two laſt nights the pain ſeemed to be ſomewhat eaſier, but without any change in the appearance or feel of the joint. Twelve leeches were ordered to be applied this night, and one grain of calomel made into a pill, to be taken every night at bed-time.

" 15th, The wounds from the leeches had bled freely; the pain, he thought, was ſomewhat abated, but the ſwelling continued much as at firſt. The medicines were continued, and a bliſter applied to the inſide of the arm, in ſuch a manner as completely to cover the one-half of it. As the pill had purged him this day four times, with gripings, two grains of opium were ordered at night, to be continued till the next viſit.

" 19th, The bliſter had riſen well, and made a copious diſcharge, but was now almoſt healed; he had no looſeneſs nor gripes, and had reſted better for theſe two laſt nights than he had done for two months before. During moſt of that time he had been obliged to ſit up in a chair throughout the night, but two nights ago had ſlept four hours at a time in bed. His calomel and opium were continued, and a bliſter applied to the outſide of the arm ſo exactly as to cover the other half of it.

" 24th, Thinks the pain ſtill diminiſhing, and has ſlept in general four hours every night ſince laſt report, but frequently waked with ſuch intolerable ſhooting pains, as to make him leap out of bed. The inſide of the arm was now ſo well as to admit of the application of another bliſter, which was accordingly laid on at night. The gums were now ſomewhat ſpongy, and his breath a little tainted; for which reaſon the calomel pill was ordered to be taken only every ſecond night. The opium was continued.

" 29th, The pain ſeemed to be ſtill leſs ſevere, and the ſwelling now began to diminiſh; the bliſters were completely healed. Another was applied on the joint from the one ſide to the other, extending three inches above, and three below it. The opium and calomel were continued as before.

" April 5th, The violence of the pain is greatly abated, but he ſtill finds himſelf unable to bend the joint in the ſmalleſt degree. As his mouth was ſore, the calomel was omitted, but the opium continued, with the addition of half a grain. A bliſter was this night ordered to the back part of the joint, of a magnitude ſufficient to cover the whole of it, in the ſame manner as had been done on the fore part.

" 12th, The pain ſtill decreaſing, and the ſwelling very ſenſibly diminiſhed. The bliſter on the fore part ordered to be repeated. His mouth ſtill affected; ordered to be waſhed with fig-tea. Belly regular.

" 17th, Swelling greatly abated; pain ſevere only at times; and he thinks he can move the joint a little without increaſing it; his mouth leſs affected. The opium continued, and a bliſter applied behind as formerly. As his belly was coſtive, ſix drams of Rochel ſalt were ordered to be taken in a cupful of weak tea in the morning.

" 26th, The ſwelling almoſt completely gone, but ſtill complains at times of ſhooting pains, as he ſays, in the body of the joint. A long bliſter ordered, ſufficient to ſurround the joint; the opium continued with the calomel every two nights.

" May 8th, The ſwelling appears to be completely gone; but ſtill there are frequent returns of the ſhooting pain, particularly at night. Continue the opium and calomel. The arm to be well rubbed, morning and evening, with two ounces of oil, and half an ounce of cauſtic ſpirit of ſal ammoniac, and, at night, a ſtrip of flannel to be applied round it.

" 14th, The pains leſs frequent; but, as his mouth was affected, the uſe of the calomel was interrupted, but the opium and uſe of the liniment continued.

" 24th, His mouth quite well, the pain, in a great meaſure, gone; every thing omitted but the liniment.

" June 10th, The ſhooting pain ſeldom or ever felt, but he can move the arm very little. I ordered him to take a pound weight in his hand, and ſwing it gently backwards and forwards twice a-day, and, once in eight days, to add another to it, if the pain did not return. In four weeks I ſaw him again, and he was then uſing four pounds, had no return of the pain, and had uſed no application to the arm. I deſired him not to increaſe the weight for ſome weeks. In two months from that time he called upon me, and informed me that he had had no return of the pain, but had not entirely recovered the uſe of his arm, which, indeed, is ſtill the caſe, though he has never had any return of his complaint."

Mr. Latta here obſerves, that where the means recommended happen to fail, recourſe muſt be had to mercurial friction, of the efficacy of which, Mr. Latta ſays, " an inſtance occurred, where, by a *gentle ſalivation* kept up for three weeks, every ſymptom of white ſwelling diminiſhed, and in eight weeks from his firſt uſing the mercury the cure was completed; nothing remaining but a ſtiffneſs in the joint, which, indeed, in all caſes, is the laſt ſymptom of the diſeaſe that is removed. This, indeed, is frequently very difficult to be cured, and continues in a great degree after

every other ſymptom has diſappeared. This ſtiffneſs obviouſly ariſes from no other cauſe than the great contraction which takes place in the muſcles, as well flexors as extenſors, from the total incapacity of the patient to uſe them. No collection of matter is ever formed in the cavity of the joint within the capſular ligament, and, conſequently, no abraſion of the cartilages, or bony concretion, can be the cauſe; indeed every day's experience ſhews that nothing of this kind ever takes place; neither is there any reaſon to ſuppoſe, as ſome have done, that it ariſes from thickened ſynovia. The diſeaſe is entirely muſcular, as is evident from its yielding to remedies which can only be thought to act upon the muſcles. Thus the relaxing power of warm water has been found of great ſervice. Fomentations with flannel wrung out of boiling water may be applied to the leg and thigh three times a-day, at the ſame time that the parts may be well rubbed with any emollient, as warm oil, &c."

In caſes of this ſort, Mr. Latta ſays he has frequently found electricity ſucceſsful; indeed this remedy has been attended, in ſome caſes, with unexpected good effects in white ſwellings, as the following caſe, related in the Medical and Phyſical Journal by Mr. Lamb, of King's Sutton, near Banbury, will ſhew.

Case III. "A middle-aged woman being afflicted with a ſcrophulous affection in the right knee (commonly termed a white ſwelling), and being in low circumſtances, was ſent to the Northampton infirmary, where ſhe was under the care of Dr. Carr for almoſt two years. The uſual remedies were applied without effect: ſhe had alſo loſt her ſpeech, for which ſhe had ſeven cauſtics applied to her back, with bliſters, &c. Theſe at firſt ſeemed to relieve her; but, on taking the ſlighteſt cold, her ſpeech would go again, and leave her quite hoarſe. After all the remedies had been tried without ſucceſs, and being of a very weak conſtitution, ſhe was thought to be an improper ſubject to undergo the operation of amputation, and was at length diſcharged, which took place a conſiderable time before I left London. She has been afflicted with this complaint about ſeven years altogether, and with great difficulty could ſhe walk with crutches. The latter end of laſt ſummer ſhe applied to me for advice, being in violent pain. It will readily be believed that I was at a loſs to know in what manner to proceed, ſhe having previouſly had ſuch excellent help. The only thing that appeared to me at all likely to give her the leaſt relief was electricity, which I accordingly propoſed to her, and ſhe conſented to ſuffer a trial. I gave a few gentle ſhocks in a variety of directions through the affected part, and alſo through the cheſt, which, to my great ſurpriſe, reſtored her voice immediately, and it continued ſeveral weeks; but, by taking a violent cold, ſhe loſt it again; however, two or three ſhocks recovered it. The pain and hardneſs in the knee began to decreaſe,

which had been ſo long contracted. I repeated the electricity three times a-week until the preſent time, and am happy to ſay that ſhe is quite recovered of her lameneſs, to the aſtoniſhment of all who knew her. The tumor is entirely diſperſed, and ſhe can walk without her crutches either up ſtairs or down, which ſhe had not been able to do for ſeven years paſt."

"The beſt method of uſing electricity," Mr. Latta ſays, "is by drawing ſparks from the muſcles, throughout their whole courſe, from their origin to their inſertion, and this continued every day for half an hour. Having perſevered in this for eight or ten days, gentle ſtrokes ſhould be given through the whole length of the thigh, placing one of the balls on the origin, and the other on the inſertion of the muſcle, thus making the muſcle a part of the circle; by which means, in a very ſhort time, the patient will recover the uſe of his limb completely." Mr. Latta proceeds to relate the following caſe:

Case IV. "Mrs. S——, aged 28, who had all her life-time enjoyed a good ſtate of health, excepting that, about four years before her preſent attack, ſhe had had a rheumatic fever, which, however, was completely cured at that time, in the month of April, 1783, four weeks after delivery, was ſeized with an ephemera. This went off by a copious perſpiration, induced by taking ſome warm fluid, ſo that in twenty-four hours ſhe appeared to be quite well, excepting only a ſlight pain in the joint of the right knee, affecting the outſide, and to which no attention was paid for ſome days. At laſt it ſuddenly ſpread over the whole fore part of the joint, which, in a few days more, ſwelled conſiderably. Having for ſome time been attended by the late Dr. Spens, man-midwife, I did not ſee her till June 23d. I found the knee greatly ſwelled round the whole anterior part of the joint, with an almoſt intolerable pain, and the leg drawn up and waſted, ſo that ſhe had not been able to lay herſelf down in bed for eight days paſt; pulſe 108; appetite much impaired; belly coſtive; the ſwelling did not indicate its containing any matter by its fluctuation, but had an elaſtic feel. Round the whole joint the ſkin appeared to be very tenſe and red.

"Hitherto ſhe had continued to ſuckle her child, but it was now given out to nurſe. Six ounces of blood were taken away by ſcarification, and the joint fomented for an hour with flannel wrung out of boiling water, as hot as ſhe could bear it, the ſame to be repeated early in the morning; beſides which ſhe had a draught with 30 drops tinct. opii. and 25 of vin. antimonial. after a laxative injection had been given at night.

"24th, The injection operated twice. She ſlept little, but thinks the pain leſs ſevere. The ſcarificator was again applied to the fore and under part of the knee, and ſix ounces more of blood taken away. The fomentations were continued every fourth

hour, and at bed-time the draught repeated, with five drops more of laudanum.

" 25th, Pulſe as yeſterday, about 100, the pain conſiderably relieved, particularly on the fore part of the joint, but ſtill finds it impoſſible to lie down; has ſlept an hour and a half laſt night. Continue fomentation and draught.

" 26th, Pain much as yeſterday; ſlept little through the night; ſwelling ſomewhat diminiſhed. A bliſter this night applied to the whole inſide of the joint. A cupful of Arabic emulſion, with two drachms of nitre to two pounds of the liquor, to be given every two hours.

" 28th, Bliſter ſtill diſcharging copiouſly; pain much abated, though ſtill ſhe cannot lie down for it. Draught and emulſion continued; belly rather coſtive. Ordered an infuſion of tamarinds with ſenna.

" 30th, Bliſter almoſt whole; pain ſo much abated, that ſhe was able this night to lie down for two hours; phyſic had operated four times, which gave relief. A bliſter ordered to the outſide of the joint; the laudanum increaſed to forty drops, and the antimonial wine to thirty.

" July 4th, Bliſter well riſen, pain much relieved; ſlept ſeveral hours in an horizontal poſture. Continue draught, and apply another bliſter to the inſide.

" By following this courſe for three months from the time I firſt ſaw her, excepting only that a more generous diet was allowed as her appetite increaſed, and pains diminiſhed, all her complaints were removed, only the ſtiffneſs of the joint remaining; and this alſo yielded to the conſtant uſe of electricity for four weeks. Two years ago I ſaw her in good health, and ſhe was then the mother of three more children."

Case V. " Mr. G——, aged 24, who had all his life-time enjoyed an uninterrupted ſtate of health, after a very fatiguing walk, in March, 1788, complained of a pain in his right knee-joint, which daily increaſed, and, in ſix weeks from the firſt attack, put on completely the appearance of a rheumatic white ſwelling. The gentleman, being a ſtudent of medicine, began to be very ſeriouſly alarmed on finding it to increaſe after the ſecond week, and from that time treated his complaint according to the moſt exact rules of art. Topical blood-letting, fomentations, cooling purgatives, &c. were uſed in vain, and the advice and directions of ſeveral eminent practitioners were given without effect, and among thoſe who attended him was the late celebrated Dr. Cullen. Finding, at laſt, that the diſeaſe was not to be got the better of in the ordinary way, and determined to ſubmit to any thing rather than loſe his leg, he reſolved, contrary to the advice of all his medical friends, to go into the country. Soon after his arrival there he began to complain of pain and burning

heat about his anus, with a conſtant diſcharge, which increaſed for ſeveral days, and the cauſe was diſcovered by his ſurgeon to be a number of venereal fici. A gentle mercurial courſe was now begun, notwithſtanding the debilitated ſtate in which he was, by reaſon of want of ſleep, pain, &c. which was continued till his mouth began to be affected. The affection of his knee now began, for the firſt time, to yield to medicine; and the mercury being cautiouſly perſiſted in for near three months, every ſymptom of venereal affection, as well as of rheumatic white ſwelling, was entirely removed. Since that time he has often declared to me, that, till the above-mentioned affection of his anus attacked him, he verily believed himſelf invulnerable in this way, viz. that he could not be affected with the venereal diſeaſe in the ordinary mode."

Mr. Latta's ſubſequent obſervations are particularly worthy of being attended to.

"Suppurations," ſays he, "ſeldom or ever take place in the true *rheumatic* white ſwelling. But it is in this diſeaſe, as in every aponeurotic inflammation, ſuch as of the eye, teſticle, &c. where great pain and tenſion take place, that, if proper medicines are not ſpeedily and diligently applied to alleviate theſe ſymptoms, the joint will undoubtedly be loſt by ſuppuration, as we too frequently ſee the eyes and teſticles are. This may happen, and only can happen, from allowing the inflammation to run too high, and continue to do ſo too long, without paying proper attention to the antiphlogiſtic regimen. Should ſuppuration, however, take place, the matter, as ſoon as it is obſerved to be formed, ought to be diſcharged by means of a ſeton, as has been obſerved in the chapter where the opening of abſceſſes is treated of, and where the ſeton is preferred to every other method.

"Should the diſcharge of this matter be too long neglected, it is evident that it may as readily penetrate into the cavity of the joint as outward; and, if ſo, this muſt at laſt occaſion the loſs of the patient's limb. By making an opening with a lancet, or otherwiſe, the air would, of neceſſity, be admitted; the matter, of conſequence, rendered more acrid; and the ligament of the joint more apt to be deſtroyed: but, by uſing the ſeton, the patient will not ſuffer much, and the ſurgeon will have the teſtimony of his own conſcience, that he has done every thing in his power to ſave the limb. Yet, after all, if the diſeaſe increaſes much, and hectic ſymptoms come on, the patient's life can only be ſaved by immediate amputation; and there is little doubt but, at any time, a limb may be amputated with ſucceſs. Inſtead, therefore, of waiting till the patient is almoſt exhauſted with diarrhœa, and other hectic ſymptoms, it ſhould be done on the very firſt appearance of them. That amputation, indeed, may be performed at any time with ſafety, is likewiſe evident, from the example of ſailors and

ſoldiers wounded in battle. How many of theſe recover where there is a neceſſity of taking off the limbs immediately after the wound has been received? During the time of the laſt war, it was ſaid, twenty amputations were performed aboard one veſſel, and of theſe patients only one died, and this rather from the loſs of blood before and during the time of the operation, than from any other cauſe, for the amputation was performed ſo high, that the tourniquet could not be applied with effect.

"In the *ſcrophulous* white ſwelling the ſame kind of treatment may, in ſome meaſure, be followed with ſucceſs, particularly bleeding with leeches. A ſolution of ammonia muriata, or ſome ſaturnine application, may afterwards be laid on the ſwelled joints, and changed every morning and evening. The patient may now and then be gently purged with any ſaline laxative." The following is the formula recommended by Mr. Latta;

(No. 33.) ℞ Sal. de rochel.
Tart. kali aa ʒiv.
Sal polychreſt.
Marin. hiſpan. aa ʒij.
Solve in aq. bullient. ℔iiij. dein adde,
Aq. cinnamon. ʒviij. Miſce.

He directs two tableſpoonsful of this ſolution to be mixed with a quart of water, and half a pint to be drank every fifteen minutes, till the four are finiſhed. He adviſes this medicine to be given early in the morning, and repeated every ſecond or third day.

Conſiderable ſuppurations frequently take place in the ſcrophulous white ſwelling, which are yet ſometimes cured. In many, particularly in the elbow joint, the ſuppuration has been known to render the bones carious. Splinters, in this caſe, have been diſcharged, while ſinuſes have paſſed into the cavity of the joint; yet, by keeping clean the ulcers, and dreſſing them ſimply, they have healed up, and the joint has at laſt recovered itſelf.

Case VI. In a girl of 15, the joint of whoſe right arm was remarkably affected by a ſcrophulous white ſwelling, Mr. Latta found the following appearances: "There were ſix openings which diſcharged a ſerous matter, two or three of them penetrating into the cavity of the joint. Several pieces had been diſcharged from the head of the ulna, through an opening now almoſt healed up. Round the joint alſo were many cicatrices of old ulcers, and three ſtill open. The diſeaſe began about four years ago with a ſmall ſwelling on the outſide of the arm, at the joint, which ſwelling continued to increaſe till the whole joint was involved in it. Her principal complaint at firſt was a burning heat throughout the ſwelling, which alſo ſpread acroſs the joint as the ſwelling went along. The ſkin over the ſwelled place put on a red and ſhining appearance, which likewiſe increaſed as the ſwelling did; ſo that, in ſix months from the firſt attack of the diſeaſe, the whole joint was affected; and, on the place where it

firſt appeared, the ſkin broke, and an ulcer was formed, diſcharging a thin ſerous matter mixed with a kind of caſeous ſubſtance; but, though ſeveral openings of this kind were formed along the courſe of the ſwelling, ſhe never complained of any great pain, and her general health was good, without the leaſt ſymptom of fever. The joint had been frequently bliſtered before the openings took place, and ſaturnine remedies applied to it. In three months' time all the openings were healed up except two, and the ſwelling now daily diminiſhed. The ſores were dreſſed with pledgets ſpread with baſilicon, and every night, at bed-time, wrapped round with two or three folds of flannel, moiſtened with a ſtrong ſolution of ſugar of lead." Mr. Latta obſerves, that ſhe has not yet menſtruated, though frequently affected with the ſymptoms which precede that flow; and as theſe increaſe, the diſcharge diminiſhes.

Caſes of a ſimilar kind have occurred, where the knee joint was affected, though, in ſome inſtances, a ſtiffneſs of the joint has remained after the ulcers were completely healed up. In patients not yet arrived at the age of puberty, therefore, Mr. Latta adviſes a delay of the operation as long as poſſible, with the uſe of ſea-bathing, and other remedies proper in the ſcrophula. This may the more ſtrongly be inſiſted on, as ſeveral caſes, where amputation was adviſed by very eminent practitioners as the only thing capable of ſaving the children's lives, have yet recovered without it. After the age of twenty-five, however, matters have a different aſpect. At this time of life it ſeldom affects any large joint, but in conſequence of an accident; ſo that every method already mentioned in the cure of ſcrophula ſhould be tried as expeditiouſly as poſſible; and, when theſe fail, recourſe ſhould be timely had to amputation. If this is delayed, very dangerous ſymptoms may come on from the deſtruction of the ligaments and ends of the bones, which cannot but terminate in the patient's diſſolution.

CHAP. IV. Of CANCER.

Sect. I. *Of* Cancers *of the* Breast, &c.

Cancers moſt commonly ariſe in the glandular parts of the body, where they are occaſioned by any bruiſe or contuſion, ſometimes a very ſlight one; and hence they are more common in the lips, and in the breaſts of women, than in any other parts of the body. Cancers have been generally diſtinguiſhed into *occult* and *open*. By the former are meant ſuch hard ſcirrhous ſwellings as are attended with frequent ſhooting pains, and which at laſt generally terminate in the latter.

By the *open cancerous ulcer* is underſtood that ſpecies of ſore which commonly ſucceeds to hard ſwellings of the glands; although

in ſome inſtances it occurs without any previous hardneſs. Of theſe we have already treated in our chapter on ULCERS. The edges of the ulcers are hard, ragged, and unequal; very painful, and reverſed in different ways, being ſometimes turned upwards and backwards, and on other occaſions inwards. The whole ſurface of the ſore is commonly very unequal, there being in ſome parts conſiderable riſings, and in others deep excavations. The diſcharge, for the moſt part, is a thin dark-coloured fetid ichor, and is often poſſeſſed of ſuch a degree of acrimony as to excoriate, and even deſtroy, the neighbouring parts. In the more advanced ſtages of the diſeaſe, by the eroſion of blood-veſſels which occurs, conſiderable quantities of pure blood are ſometimes alſo diſcharged.

Patients labouring under real cancerous affections univerſally complain of a *burning* heat over the whole ulcerated ſurface, which, in general, is the moſt tormenting ſymptom that attends the diſorder; and thoſe ſhooting lancinating pains, which were troubleſome in the more occult ſtate of the complaint, become now a great deal more ſo.

Theſe are the moſt frequent ſymptoms which attend an ulcerated cancer; but the appearances of ſuch ſores are ſo various, that it is almoſt impoſſible in any deſcription to comprehend every one. When two, three, or more, however, of thoſe enumerated concur together in the ſame ulcer, we may always be pretty certain of its being of the cancerous kind.

Concerning the *cauſes of cancer* there have been a great many conjectures, but without any ſolid foundation. It is of ſome moment, however, to determine whether they ariſe from ſome general diſorder in the ſyſtem, or whether they are only to be accounted local diſeaſes. Many of the moſt eminent practitioners have been of opinion that they ariſe from a general diſorder of the ſyſtem, and hence conſider them as totally incurable even by extirpation, as the latent ſeeds of the diſeaſe, in their opinion, will not fail to bring on a return of it ſomewhere or other. Of this opinion the late Dr. Monro appears to have been; and in a paper on this ſubject, in the Edinburgh Medical Eſſays, declares that "of near ſixty cancers which he had been preſent at the extirpation of, only four patients remained free of the diſeaſe at the end of two years." From this bad ſucceſs, and the violent progreſs of the diſeaſe, he finally concludes againſt the extirpation of cancers, and propoſes only the palliative method of cure. But later practitioners have been a great deal more ſucceſsful; and a late publication by Mr. Hill, ſurgeon, at Dumfries, has put the uſefulneſs of extirpation beyond a doubt, when the operation is performed in time; though, after the diſeaſe has continued long, and the virus been abſorbed, the whole ſyſtem acquires a cancerous diſpoſition, and the diſeaſe almoſt certainly recurs in ſome other part. From internal medi-

cines we can expect little or nothing in the cure of cancers; and external applications can do no more than palliate. Great expectations were formed from the powder and extract of cicuta; but it has so universally failed, that few put much confidence in it at present. However, it has sometimes been of service in cases of a simple indurated gland; and even where the disease has been farther advanced, it has produced a better discharge, and diminished the fetor of the sore; but as it cannot be depended upon for a radical cure, a delay of the operation is never to be recommended.

The parts most subject to this disease are the breasts of women, the womb, the tongue, the lips, the nose, and the face. We treated this matter in a partial way, in describing the *cancerous ulcer*; but the subject is of too much importance, notwithstanding the acknowledged impracticability of a cure in confirmed cases of true cancer, to be dismissed in so limited a view. We shall therefore, after a concise description of the disease in a part more particularly exposed to it, and a description of the means by which, alone, life can be preserved in certain cases, speak somewhat in detail of the means which have been tried by different practitioners, since it will at least answer a good purpose in preventing others from going over the same ground without sufficient encouragement.

No part of the body is more subject to cancer than the breasts of women. Cancer of the *mamma* may arise at any period of life, though it seldom appears till about the time the menses usually disappear. Tumors arising in the breast previous to this period, have been considered by some practitioners as being only of a scrofulous nature, and it is probably owing to that circumstance that several cures have been of late years made on tumors of the breast by mercurial frictions and other remedies.

Scirrhus and cancer of the breasts are distinguished by the following marks:—When the tumor is first observed, it is commonly in form of a small hard knot in the glandular part of the mamma, while the skin at the same time is free from inflammation. It frequently continues in that state for several months: by degrees, however, it increases considerably in size, and at last a sharp pain is felt shooting towards the axilla. The lymphatic glands at the under edge of the pectoral muscle and in the axilla are often enlarged, and an occult cancer is now formed. By degrees the integuments over this part of the tumor in the mamma become discoloured, and at last an ulceration or open cancer breaks out. Violent hæmorrhages now frequently ensue; the pain becomes still more excruciating: and unless proper assistance be given, the patient is generally cut off in not many months after the breaking out of the cancer.

In early stages, the disease in general may be considered as entirely a local affection, and a radical cure may be of course expected; but in proportion as the skin shall afterwards be found diseased and ad-

hering to the gland, and that to the pectoral muſcle, and the lymphatic glands near the mamma and in the arm-pit ſwelled, the chance of a cure becomes more doubtful, as the cancerous matter may have been abſorbed, and part of it carried into the ſyſtem. The moſt unfavourable ſtate for an operation is when there are ulcerations in the breaſt, large, deep, and of long ſtanding; and particularly if theſe are attended with great pain, when the arm of the ſide affected has become œdematous, and the health of the patient is much impaired. In this laſt ſtate, very little is to be expected from a ſurgical operation.

In *extirpating the mamma*, which we ſhall firſt ſuppoſe is to be done where the ſkin is ſound, and where the tumor has no uncommon adheſion to the pectoral muſcle, the patient ought to be placed horizontally in a bed, or upon a table covered with a mattreſs, &c. The operator is to be ſeated, and to have proper aſſiſtants. A longitudinal inciſion is then to be made with a common ſcalpel through the ſkin and cellular ſubſtance along the whole extent of the tumor, and at a little diſtance from the nipple, which is to be ſaved. When the longeſt diameter of the tumor is acroſs the body, inſtead of a longitudinal inciſion, a traverſe one is to be made. The integuments being diſſected from the mamma on both ſides of the inciſion, the patient's arm is to be extended to ſave the pectoral muſcle; and the whole glandular part is to be detached from the muſcle, though a ſmall portion only ſhould be diſeaſed, beginning at the upper ſide, and ſeparating downwards. If there be any indurated glands, they are to be carefully removed. If the patient be faint, a glaſs of wine, or ſome other cordial, is to be given. After the diſeaſed parts are removed, the wound is to be cleaned with a ſponge wrung out of warm water, which will generally render the ſmall bleeding veſſels more conſpicuous. The integuments are next to be cloſely applied to the parts underneath, and retained there by the twiſted future, and likewiſe by a few adhefive ſtraps. A large pledget of ſimple ointment is now to be laid over the whole; and this is to be covered with a thick compreſs of lint, tow, or ſoft linen; and the dreſſings to be kept in their place, and moderate preſſure made by the napkin and ſcapulary bandage.

By this method, the integuments will generally ſoon adhere, and a union will be effected by the firſt intention. But it does not often happen that the operation is performed while this favourable mode of practiſing it will anſwer; on the contrary it has often happened, that, although the ſkin bore no marks of a cancerous affection, the diſeaſe has been renewed and terminated fatally.

In general, before extirpation of a breaſt is recommended by the ſurgeon, or ſubmitted to by the patient, a conſiderable portion of the external integuments are ſo much diſeaſed as to render it neceſſary to ſeparate them along with the glandular part of the mamma. It ſometimes happens, likewiſe, that the tumor adheres to the pec-

toral muſcle, and that again to the ribs. In either of theſe caſes it becomes neceſſary to remove all the diſeaſed parts. For this purpoſe, two inciſions of an oval form, with ſharp extremities, of a ſufficient ſize to include the whole of the affected parts, become neceſſary. If, again, it be found, that beſides the diſeaſe of the breaſt, the lymphatic glands in the neighbourhood are indurated, or otherwiſe diſeaſed, the firſt inciſion ought to extend at once over theſe; and after the other parts have been removed, and the veſſels ſecured, the whole of the diſeaſed glands are to be extirpated; and in performing this part of the operation, conſiderable aſſiſtance may be given by ſupporting them with a hook, or a ligature paſſed through them, till they are entirely removed. When they lie deep in the axilla, the points of the fingers, or the end of the handle, will ſometimes be ſafer than the edge of the knife. After having removed all the glands which are in the ſmalleſt degree affected, the cut edges of the ſkin are to be brought as near to each other as the nature of the caſe will allow, ſo as to heal as much as poſſible by the firſt intention. After the wound is nearly, or perhaps entirely healed, an iſſue, inſerted into the arm of the oppoſite ſide, will be the beſt means of preventing a relapſe.

As the ſucceſsful treatment of a cancer, however, in its advanced ſtate, is ſcarcely within the ſphere of ſurgery to accompliſh, it appears the more indiſpenſable to attend to thoſe means which may be called for in its incipient ſtate, when a cure may be obtained. In addition to what has been ſaid under the head of *cancerous ulcer*, we ſhall here notice the treatment recommended by different practitioners. The late Mr. Juſtamond, ſurgeon to the Weſtminſter hoſpital, found (or thought he found) great advantage in the internal uſe of flores martiales *(ferrum ammoniacale)* accompanied with the topical application of a liquid, of foreign invention, but of which equal proportions of tinctura ferri muriati, and ſpirit of wine, form an adequate ſubſtitute. The former was exhibited in ſuch quantities as to enſure its full effect on the conſtitution, the latter was uſually applied with a camel's-hair pencil, or, in a diluted ſtate, on linen rags. The following caſes, of ſchirrus or *occult cancer*, but which, ſome of them at leaſt, ſhould rather be deemed ſimple diſeaſes of the milk breaſt, will ſerve to ſhew how far this practice is worthy of adoption.

Case I. M. Perrin, an old woman between fifty and ſixty, who, in the year 1772, was made an out-patient in the hoſpital. The late Dr. Brickenden had for a conſiderable time tried ſeveral things to relieve her with no effect. She had been troubled for ſome years with two ſchirrous tumors in the left breaſt, which, when ſhe applied there, were both very large and hard, one of them as big as a fiſt, and which had latterly become very painful. Both the tumors were looſe, but the largeſt of them formed an angular projection, which was near the ſurface of the ſkin, and appeared likely to adhere to it at that ſpot. This woman never did any thing

more than take the flores martiales very freely, and apply to the tumors linen rags dipped in the liquid, which she renewed several times in the day. She certainly used this liquid more freely than any other patient who ever tried it, for her skin not being tender she was able to bear it much better. Add to this, that in a few months she found herself so much relieved from the pain of the disease, that she paid little attention to the smart of an application from which she experienced so much benefit. She persevered with great resolution, and with very little intermission, in the use of these remedies for upwards of a twelvemonth; at which time she was entirely free from any kind of pain; and the tumors were so considerably decreased in every respect, that they were reduced to much less than a fourth part of their former size. The least tumor was, indeed, scarce perceptible, and the largest was almost flat, and was divided by several chops or fissures under the skin, which made it feel as if it were cracking to pieces. The angular projection was removed from the skin, to which there was now no danger of an adhesion being formed; and the tumor was so remarkably softened that it felt rather like a piece of wet and rumpled rag in the breast than like an indurated gland. It was pleasant to see how evidently this woman recovered her health, which was in a very languid state when she first applied, and how lively and full of spirits she became; an effect which often followed when the martial flowers were taken freely for any length of time. But this was all the advantage she was able to gain; it was never possible to dissolve the tumors entirely; for they remained in the same indolent and quiet state till the time of her death, which happened about two years after, from an illness totally independent of the complaint. She had, indeed, done nothing for a considerable time before she died, except that she used the liquid now and then, which seemed to contribute to keep the part *in the same state*, a little more than a year after she began the process.

Case II. Mrs. H. aged 30, applied on the 19th of October, 1773. She had been seized with a fever nine days after her lying-in. This brought on an abscess in the left breast, which got well in about a fortnight, and when the discharge was nearly stopped, she found a swelling come on in the right breast. It was then very painful, and much swelled, even under the arm-pit. Linseed and bread and milk poultices had been assiduously applied for more than two months, which though they alleviated the pain, yet still the swelling remained invariably the same; when there appeared to be an oblong indurated tumor, very hard to the touch, about four inches in length, and extending across the nipple. Imagining this to be a milk breast, the application of a solution of crude sal ammoniac in Hungary water was ordered, and continued more than a fortnight without producing any effect. But as it was not usual, for that application, persisted in so long, to fail of curing milk breasts, the patient then used some of the liquid before described. She was

directed to dip a double rag in it, and lay it all over the tumor, and to wet the rag as often in the day as the ſkin would bear it; taking the precaution of guarding the nipple either with a piece of dry lint or a pledget of ſome ſoft ointment, leſt the liquor ſhould excoriate it. In a few days the tumor began inſenſibly to melt away, and in leſs than three weeks it totally diſappeared.

Case III. Ann Highland, aged 29, came into the hoſpital in the year 1773, with a large indurated tumor in the breaſt, eleven months after giving ſuck to two children. In the beginning of the eleventh month the children were ſeized with the ſmall-pox. Soon after this ſhe perceived a ſwelling in her breaſt, which in three weeks burſt into five different apertures, and diſcharged a ſmall quantity of matter. She uſed a bread and milk poultice for more than two months without effect, before ſhe applied to me. At this time, all the original orifices were ſtill open, and there was a large indurated gland in the midſt of the breaſt: there was alſo a ſwelled gland under the arm-pit. She ſuffered extremely with the pain of this complaint, which ſhe deſcribed as of the pricking, darting kind. The ſores were all ſloughy, and of a purple hue. Though it be frequent to ſee the ſores have an ill-conditioned aſpect in milk breaſts that are treated with bread and milk poultices, yet this had ſo very bad a look as to forbid its being conſidered as a mere milk breaſt, more eſpecially as the complaint had come on ſo long after lying in, and therefore the patient was ordered to uſe the liquid as the former had done, not even covering the ſores with any thing elſe. This application was renewed five or ſix times in the day, as often as ſhe could bear it, for it ſmarted much on being firſt applied, and the ſmart laſted about an hour. In a few days ſhe found much relief from the pain; and the firſt and almoſt immediate effect of the application was, that the milk flowed plentifully with the matter from all the ſores, and from the nipple. In a ſhort time the ſores were all healed, and in a month the enlargement of the gland under the arm-pit was diſperſed, and the large ſwelling itſelf conſiderably diminiſhed. This induration, however, ſtill ſubſiſted; but as ſhe was now entirely free from pain, and deſirous of returning to her family, ſhe went out of the hoſpital, and by perſevering in the uſe of the liquid ſix weeks longer, was perfectly cured. The free diſcharge of milk occaſioned by the firſt application of the liquid in this caſe, indicated that there was a coagulation of that fluid attending this complaint. But the ſymptoms above deſcribed, the form of the tumor, the looſeneſs of the cellular ſubſtance of the breaſt, which in this caſe was entirely free from induration, and the continuance of the pain, though a free iſſue was given to the matter by five openings (a circumſtance which uſually procures eaſe in milk breaſts), and the time, near three months, employed in getting rid of the diſorder, afford ſome reaſon to conjecture that it partook more of the nature of a recent ſchirrous tumor.

Case IV. Mrs. B. aged 30, who applied for assistance at the desire of Mr. Jarvis the surgeon, on the 11th of November, 1773, had lain in six months before. A fortnight after her lying in, she had her right breast disordered from a coagulation of the milk. This complaint lasted about two months, and as that breast got well a hardness was formed in the other, which suppurated and discharged a great quantity of matter. The wounds healed, but left an indurated tumor, which sometimes partly disappeared and came again. It returned about two months before she applied, bursting again, but the wound had been closed about a fortnight before. At this time, there was a considerable induration extending almost over the whole breast. It was hard to the touch, in some parts unequal, and attended with much pricking, darting pain at intervals. This was treated as the former case. The pain soon went off, and the tumor lessened, but it was near four months before it was completely dissolved.

Case V. In the month of May, 1774, a physician's lady was afflicted with a schirrous tumor of considerable standing. The swelling was remarkably hard and stony, and so large that it occupied almost the whole breast, and extended towards the arm-pit. The pain was very acute, and, indeed, she complained of wandering pains over the whole body, which made her life very uncomfortable. About the middle of the tumor, towards the nipple, the skin adhered to the surface, and was already discoloured, so that this schirrus would certainly have burst very soon, and have become an ulcerated cancer. Her husband approving of the plan of treatment pursued in the foregoing instances, she was put on the same course, and also used the hemlock bath. She took the flores martiales as freely as she could, and applied the liquid externally, and every advantage to be expected was obtained. The patient was much relieved from pain, the tumor was softened and diminished in size, and it was kept from bursting, which it most probably would have done in the course of a few weeks. This amendment continued a longer time than we had any reason to expect from the state of the disease, and the age of the patient. In a word, from the time the relief began to be apparent, which was after persevering about three or four months in the methods prescribed, she remained upwards of a year in a very tolerable state. It was not till the autumn or beginning of the winter 1775 that her pains seemed to return, with more violence than she had felt them for some time. The tumor, however, was not yet burst, but there now appeared a vesicle of blood immediately under the cuticle, which seemed once more ready to make an opening. Upon considering the alteration made in the tumor, which was much diminished from its former size, it was thought right to accelerate the bursting of the cuticle, and therefore into the vesicle of blood a lancet was thrust, in order to try whether, by the use of the *arsenical caustic* (*arsenicum anti-*

moniatum of the Pharm. Chirurg.), applied with such a proportion of opium as to prevent its acting with violence, the gradual removal of the whole of the tumor could be effected. But whether the state of the disease would not admit of this method of treatment, or whether the patient's age was unable to bear the process, cannot be determined. It is certain, however, that she fell a victim to the disorder in the beginning of the year 1776.

Mr. Justamond asserts, that, in the number of schirrous cases he treated in this manner, there were several, the progress of which has been checked in a most evident manner. This, he says, has been remarkable in one very deplorable instance of the kind. There is a species of schirrhus, which seems not sufficiently distinguished by writers on this subject, and may be well styled the true *occult cancer*; more malignant in its nature, more terrible in its effects, more rapid in its progress, and more certainly fatal, than any other. Whether it may differ in its nature from other cancers he is uncertain, but imagines that its peculiar malignancy arises from its seizing upon a large portion of the animal machine at once, and not advancing by slow degrees, and from almost imperceptible beginnings, as the more frequent indolent schirrhus or creeping cancer does. One of the distinguishing marks, indeed, of this disease, is the whole substance of the breast being suddenly attacked with a stony and almost immoveable hardness. The disease is sometimes confined to this part at first, sometimes extends to the arm-pit, the neighbouring ribs, the clavicle itself, and the glands of the neck. The pain of the disease is exquisite, scarce to be moderated by the most powerful opiates, and the patients describe it as a constant gnawing. He asserts that he never saw any of these cases relieved by any known method, not even the operation, though practised at the most early period, and before the disease appeared to have extended itself beyond the part. The fate of the patient, indeed, is in general soon decided. From six weeks to two or three months, or at most six, are generally the limits of it. Mr. Justamond describes one of these lamentable cases in the following terms:

Case VI. The author was called to a lady with one of these occult cancers, in the year 1774. Besides the whole breast being indurated in the manner before described, there was a schirrous gland lying deep in the arm-pit, which occasioned the arm to swell, though the disease was very recent; and there was also an indurated fixed tumor above the clavicle. A surgeon of remarkable sagacity and extensive practice had seen this case a few days before. He was too well acquainted with the fatal prognostic of this disease, which he thought would terminate in a few weeks, not to give warning of it to the patient's friends. But even in this terrible case the pain was evidently diminished by the hemlock bath, and the rapid progress of it seemed, for a while, to be checked. But

theſe deceitful hopes did not laſt long, for ſhe died about ſeven months after ſhe had been under treatment. Upon examining the body after death, the breaſt was found ſtrongly adhering to the ribs, ſome of which were carious. The cancer had even penetrated the cavity of the thorax, and affected the internal ſurface of the pleura. Moſt of the clavicle was totally rotten, and fell to pieces upon the touch; beſides which, there was a large cancerous gland in the groin on the oppoſite ſide to that where the breaſt was affected. The ſtench, too, was almoſt intolerable, though it had been very trifling while the patient lived, and that no kind of ſmell was perceived till near the period of her exiſtence.

One remarkable effect happened, which may poſſibly be juſtly attributed to the *hemlock bath*; for the ſame was obſerved in this and two other caſes, where the diſeaſe was extenſive. This circumſtance is the formation of an abſceſs, ſome few months after the bath had been uſed. In the fore-mentioned caſe, it was formed in the fore-arm of the diſeaſed ſide; in another, under the arm-pit of the oppoſite ſide; and in the third, in the groin of the oppoſite ſide. From theſe circumſtances, and the large ſuppurations brought on by this bath in two other caſes of ulcerated cancer, we may preſume, that the quantity of hemlock abſorbed by this mode of introducing it into the habit, muſt neceſſarily quicken the circulation, and put all the fluids in agitation, by which means theſe ſuppurations are probably brought on. It may be obſerved, by the way, that theſe effects ſeem very contrary to paralytic affections, which ſome learned men think the hemlock has a tendency to produce. There is however no direct evidence of any paralytic ſymptom having ariſen from it, nor indeed any other bad ſymptom, unleſs theſe ſuppurations ſhould be deemed ſo, which however, it muſt be remarked, healed very kindly after having been opened, notwithſtanding the cancerous diſeaſe prevailing in the habit.

Finding many of theſe ſchirrous caſes obſtinately reſiſt every method employed for their cure, though they were moſt of them relieved, Mr. Juſtamond was induced to try the effect of an arſenical plaſter to them, encouraged by the evident advantages he had ſeen to reſult from the external uſe of the arſenic in cancerous ulcers. For this purpoſe he choſe to employ the mildeſt preparation, namely, ſome of the yellow orpiment, levigated, and mixed with ſuet and other ingredients to the conſiſtence of a pretty ſoft plaſter. It contained no more than one grain of arſenic to four of ſulphur, and was ſo much weakened by the combination, that a quantity of this powder, containing five grains of the arſenic, might be adminiſtered internally with greater ſecurity than one grain and a half of the crude mineral. Beſides this, the preparation would be ſtill weakened by the addition of the ingredients neceſſary to form it into a plaſter; ſo that there was not the leaſt reaſon to ſuſpect this application would be attended with any bad conſequence. Nei-

ther, indeed, was that likely to have happened, had it not been for an accidental circumſtance, which could not be foreſeen. This plaſter was applied to fix different patients at the ſame time, and in a little while the ſchirrous tumors afforded ſuch evident marks of diminution as were very encouraging. It was afterwards tried in another caſe, where the patient was at the ſame time uſing the hemlock bath. But here ſome paralytic ſymptoms began to ſhew themſelves; yet ſo imperceptibly at firſt, that no one was aware of the danger till it increaſed beyond the power of relief. That ſuch an effect could be produced by this mild arſenical plaſter was not ſuſpected, till another patient who had applied it for ſome months with great benefit without uſing the bath, was at length ſeized with very diſagreeable complaints in the bowels, upon going into the bath, while ſhe uſed the arſenical plaſter. She was, however, relieved from this attack; but from theſe inſtances it was plain that the warm water, by opening the pores, had occaſioned too great an abſorption of the arſenic, and had perhaps contributed to ſeparate it from the ſulphur; without which proceſs it is likely theſe ſymptoms could not have been brought about. However this may be, though the other patients who uſed the ſame application, and did not go into the bath, had not ſuffered any diſagreeable ſymptom, it led to a determination never to uſe it more.

In one of the ſchirrous tumors, in which the fore-mentioned methods were tried without ſucceſs, an attempt was made to extirpate it by the arſenical cauſtic. The patient was extremely timorous, and would by no means be perſuaded to ſubmit to the operation by the knife. She had a very hard ſtubborn ſchirrus in the right breaſt juſt above the nipple, of the ſize of a ſmall apple, and beyond this a ſmall indurated gland under the axilla. The arſenical preparation uſed in this caſe was the following:

(No. 34.) ℞ Antimonii in pulvi trit. unc. ij.
Arſenici alb. unc. j. Miſce.

Theſe being fuſed, in a crucible, together, and being afterwards reduced into an impalpable powder, a few grains were mixed with as much powdered opium. But as the ſkin was entire, and as the arſenic would not act through the cuticle, the day before this powder was applied it became neceſſary to rub the whole ſurface of the gland gently with lunar cauſtic. By this contrivance the cuticle was eaſily ſeparated next day, when a ſmall quantity of the powder being mixed with part of the yolk of an egg, ſo as to bring it to the conſiſtence of an ointment, a pledget was ſpread, cut to the ſize of the gland, and applied to its whole ſurface. The pain was very great for the firſt four-and-twenty hours, but after that ſubſided. This firſt dreſſing remained on for ſeveral days, and when removed, it appeared that that part of the ſkin on which the cauſtic had been applied was cracking all round and the tumor beginning to ſeparate. In expectation of facilitating this ſeparation, a few ſca-

rifications were made on the deſtroyed ſurface, and the crevices filled with more of the powder, applying over it a pledget of the ſame kind as the former. By repeating this, a ſeparation of the tumor was effected in little more than two months, and the gland came out entire as a nut out of its ſhell, or as if it had been cleanly diſſected with a knife. To the ſmall gland under the arm-pit nothing was done, in the hope that it would diſſolve ſpontaneouſly by the ſuppuration of the larger one, but it ſtill remained; though this circumſtance did not prevent the wound made by the ſeparation of the larger gland, from healing very faſt. Seeing the ſmall gland ſtill exiſt after the healing of the wound, perſuaſions were uſed with the patient to allow the cauſtic to be applied to that in the ſame manner as it had been to the large one. But ſhe was ſo well ſatisfied with having got rid of the moſt material part of the diſeaſe, and being freed from the pain which that gave her, and ſo fearful of going through the ſame violent pain again, that ſhe choſe rather to remain with it as it was. She was ſeen about a year and a half after this in perfect health; the little gland under the arm-pit remained indeed, but it was neither increaſed nor decreaſed in ſize. She ſuffered no pain from it, and there was then no other appearance of farther miſchief.

The danger of treating cancers with arſenic externally is here too manifeſtly ſhewn to juſtify the exhibiting it, at leaſt for any length of time. We ſhall here introduce ſome caſes in which arſenic was exhibited *internally*.

There has been publiſhed by Dr. Ruſh, in the American Tranſactions, and ſince inſerted in the Medical Commentaries by Dr. Duncan, vol. i. decad. 2d. *a paper on arſenic in cancerous affections.* Dr. Moſeley has likewiſe given an account of the ſucceſsful effects of ſublimate in the ſame complaint, in his Treatiſe on Tropical Diſeaſes, from which the reader will have an extract. Mr. Juſtamond, after obſerving, that, in the full exhibition of *hemlock* in every form, as well as in the other means employed, his hopes were cruelly fruſtrated in many inſtances, "yet," ſays he, "I could not but be convinced from the reſult of all my caſes, that ſomething more had been effected by theſe methods, than had been done by others; and as arſenic ſeemed to be the beſt application externally, I reſolved, in the firſt obſtinate caſe, to try it internally. I was the more induced to this, from knowing that it had been adminiſtered by others, and from an account recently publiſhed, in which it was ſaid that this medicine had been given with effect in cancerous complaints. I determined, however, to give it in my own way, and therefore weighed out a grain of arſenic, and mixing it thoroughly in a glaſs mortar with a ſcruple of teſtaceous powder, made it up into a maſs of pills, with a ſmall quantity of ſyrup. This was divided into ſixteen pills, made exactly equal, by carefully weighing them ſeparately againſt each other." The author relates the following caſes.

Case I. "On the 5th of October, 1774, Ann Bond applied to me with a cancerous ulcer on the right side of the tongue about the size of a crown-piece, surrounded with indurations, and very painful. She came into the hospital on the 18th of January, 1775. She was at first put into the hemlock bath, the flores martiales were administered internally, and the ulcer was smeared with a mixture containing one drachm of spirit of salt, five grains of arsenic, and twenty of opium, with a sufficient quantity of testaceous powder to make the whole into a consistence somewhat like that of mel ægyptiacum, a portion of which was also sometimes added to this mixture; and whenever any separation was likely to take place from the action of the arsenic and the spirit of salt, the use of the mixture was suspended, and the mel ægyptiacum used alone. Sometimes the sore was merely washed with my liquid. When the mixture was used, the patient was directed to take particular care not to swallow any of her saliva for several hours after, and to wash the mouth with some of my liquid, lowered with water, before she swallowed her saliva, or took any food. The corrosive sublimate was soon after substituted for the martial flowers, as being judged, from Doctor Akenside's observations, to be a medicine better adapted to this case. With this medicine internally, and the before-mentioned applications externally, some advantages were gained; but the disorder still proving obstinate, I resolved at length to give the arsenic internally, beginning with the sixteenth part of a grain every day, and gradually and carefully increasing the dose till my patient took a grain in the day. This patient could not bear much more than this quantity, for when she had taken a grain and a half for a few days, she was seized with tremors of the limbs. But another patient I had at the same time with a cancer in his face, who was a remarkably strong man, took two grains of it daily, without finding the least inconvenience from it. From the time of my using this medicine, the appearances grew so favourable, that I was in great hopes of completing the cure, and many other surgeons who saw the case with me, and had seen it in its worst state, were of that opinion. But the obstinacy of the disease made me judge it necessary to increase the dose of arsenic, if my patient could bear it, and therefore I fused it with four times its weight of sulphur, with the view of tempering the violence of its action. I began with the same quantity mixed with sulphur that my patient had been used to take by itself, that is, a grain of arsenic in the day; and soon found that I could use it much more liberally in this way than before. For she soon took four and five grains of the mineral every day in this combination with sulphur, with less inconvenience than she took one grain and a quarter of the arsenic alone. But if the violence of this medicine was diminished by this combination, it soon became evident that its efficacy was likewise decreased by it; for the disor-

der ſeizing the tonſils and other glands about the neck and throat, the patient died in about ten months from her admiſſion into the hoſpital.

"This and the ſucceeding caſe of *a cancer in the face*, were the only two inſtances in which a *fair trial* was given to the *internal* uſe of arſenic. Encouraged by the fair proſpects theſe trials afforded me at firſt, I had begun to give it to two other patients. But as the hopes I had entertained of its efficacy in the two firſt inſtances, were afterwards diſappointed, and that, however promiſing the internal uſe of the arſenic might appear to me in theſe complaints, it ſtill ſeemed impracticable to give it in ſuch doſes as to inſure ſucceſs, I thought myſelf not juſtified in continuing or repeating the trial. I therefore would not ſuffer my other patients who had begun, to continue taking it; and from that time never preſcribed any arſenic internally, judging that the advantages ariſing from it were not ſufficient to compenſate the riſque. The aſcertaining of this point appears to me to be a very eſſential, and, indeed, a very neceſſary circumſtance, for if, from the boldneſs of ſome publications on the ſubject, others ſhould be tempted, as I was, to make the experiment, in hopes of contributing to the relief of mankind in theſe terrible caſes, they will probably be deterred from it by this fair expoſition of the matter. At the ſame time, I am inclined ſtill to think, from all the obſervations I have been able to make, that arſenic is really the true antidote againſt this diſeaſe; but as its internal uſe is attended with great danger, and that every attempt to correct its noxious qualities ſeems to leſſen its efficacy, it is not probable that it can ever be given ſo as to produce a complete cure.

Case II. "The other caſe of a cancer in the face, alluded to above, in which a fair trial was given to the internal uſe of arſenic, was that of Mr. Champneſs, a man of the moſt vigorous conſtitution I ever knew. He was 67 years of age when he applied to me, in Auguſt, 1773, and his complaint had then been of eight years' ſtanding. He had been for two years under the care of an eminent and ſkilful ſurgeon of this town, who, as he informed me himſelf, had very humanely taken a great deal of pains to do him ſervice, though his attempts had not been attended with ſucceſs; for the patient aſſured me, that the diſeaſe had been conſtantly increaſing ſince that time, and that its progreſs had been very rapid for the laſt fortnight before he addreſſed himſelf to me. When I ſaw him firſt, all that part of the face between the edge of the os malæ and the ala of the noſe on the left ſide was eaten away. The lower part of the ala of the left noſtril was quite corroded, the lip ſeparated from its adheſion to the gum, and almoſt deſtroyed on the left ſide. The ſmall remaining part of the lip on this ſide was very hard, and the induration extended to the right ſide and up the right noſtril. This patient, as I before obſerved being of a remarkably ſtrong habit of

body, I had an opportunity of giving the arſenic its full trial with him, both externally and internally, and with ſuch appearance of ſucceſs, that in the beginning of the year 1775 all the ſores had healed except one, and that was in ſo favourable a ſtate, and my patient ſo free from pain, that I had ſcarce a doubt of completing the cure, and, indeed, told the gentleman who had before attended him, of this expectation. But my hopes were again diſappointed. The wound was never completely healed, and though the diſorder remained very tolerable, and was kept from ſpreading for a twelvemonth after this, yet about the end of that time it began to break out again, till at length it reached the glands of his throat. Notwithſtanding this, he lived till the latter part of the year 1778, and for the laſt year of his life, as I have been informed, in a very miſerable ſtate, having loſt ſo much of his lip, jaw, and teeth, that it was with the greateſt difficulty he could ſwallow any food. Though this patient perſevered in the uſe of the arſenic for ſix months, in the doſe before mentioned, yet he never experienced the leaſt inconvenience from it. He was in good health, and continued even his daily labour all the time he was taking it, and for a long while after he had left it off.

"As I have hitherto only mentioned two methods in which I applied the arſenic externally in cancerous ulcers, to wit, the arſenical and metallic preparation uſed in the firſt caſe, and the arſenic fuſed with antimony in other caſes, I ſhall now communicate another method of uſing it, which I firſt tried on Mr. Champneſs; I mean, mixed with an equal quantity of ſublimate. This haſtened the action of the arſenical cauſtic conſiderably, and made a much larger eſchar, nor did it appear to cauſe greater pain than was complained of when the arſenic was uſed alone. It muſt, however, be obſerved, that a large ſhare of opium was mixed with every cauſtic I applied, from which conſiderable advantages reſulted, the pain being generally leſs in proportion to the quantity of opium employed."

Much has been ſaid formerly, and repeated of late, on carbonic acid gas (fixed air) in theſe complaints; and as great expectations have been raiſed by ſome writers, of this, as a remedy in open cancers, we ſhall take this opportunity of communicating Mr. Juſtamond's obſervations reſpecting the uſe of it in theſe diſorders.

"I have tried it," ſays that gentleman, "in ſeveral caſes of ulcerated cancer for a conſiderable time; and purſued the following method in applying it. I firſt adapted an open bladder to the end of a flexible tube of a convenient length, and placing this bladder upon the ſound parts round the cancerous complaint, ſo as carefully to include the whole of the diſeaſe. I confined the margin of the bladder by applying to it a piece of adheſive plaſter, which was likewiſe held cloſe to the ſurrounding parts by one or more aſſiſtants. The end of the tube was then fixed into the mouth of a pretty large bottle, into which the uſual fermenting materials had been put. This applica-

tion was renewed twice or three times in the day, and if I could have prevailed upon my patients to do it oftener, I would; being of opinion, that if any ſucceſs were to be expected from it, it muſt be owing to its being reiterated frequently. I imagined, indeed, that if it had been poſſible to keep the part conſtantly immerſed in fixed air, without any communication with the external air, this would be the moſt likely method of inſuring ſucceſs. However this may be, in all the caſes wherein I tried it, it did not by any means confirm thoſe expectations that report had raiſed in me of its utility. It never in any one inſtance diſpoſed the cancerous wound or any part of it to heal; and all the benefit I experienced from the uſe of it, was *keeping the wound ſweet and clean.* This indeed is no inconſiderable advantage, where theſe effects cannot be brought about by other means leſs inconvenient than this. Neither can I aſcertain whether it contributed in any remarkable degree to abate the pain of the diſeaſe, for all the caſes I tried it in were very far advanced, and the patients having been uſed to obtain relief from opium, did not chooſe to relinquiſh a medicine, the good effects of which they had felt.

"There are, indeed," continues the author, "other means of correcting the ſmell of cancerous ulcers, and much more ſimple than the application of an apparatus for the generation of fixed air, and which, from all the obſervations experience has furniſhed me with on this point, ſeem to anſwer the purpoſe as effectually. The ſeveral topics I have uſed for this purpoſe are the flowers of zinc, the calamus aromaticus in powder, either alone or mixed with ſuch a proportion of powdered ſalt ammoniac as my patients could bear; ſulphur, either alone or combined with a ſmall portion of arſenic; (which laſt preparation has been already ſpoken of fully in page 394, of this work). Theſe are the dreſſings I have chiefly uſed in the intervals of ſuch as were more active, and by means of which, I have generally preſerved cancers from any very offenſive ſmell; and even in the laſt ſtage of the diſtemper, have ſucceeded in diminiſhing greatly this nauſeous ſymptom. Doctor Wathen ſaw a remarkable inſtance of this in an extremely offenſive cancer, which he ſaw with me in the moſt deplorable ſtate of the diſeaſe. He expreſſed his ſurpriſe on finding this ſtench much corrected in a few days by means of ſome of the fore-mentioned alcaline and abſorbent powders, aſſiſted with an outward covering of rags dipt in ſpirituous applications. The ſpirituous covering I generally uſed in theſe caſes, was the martial and ammoniac tincture above mentioned, either alone or diluted with water, without the addition of the oil of vitriol, which anſwers nearly to the common tincture of ſteel with ſalt ammoniac, to be found in ſome diſpenſatories. I ſhall here obſerve, that in all offenſive cancers we ought religiouſly to abſtain from every kind of greaſy application, however mild and innocent it may be, and even were it only uſed with a view to keep on the dreſſings. No ointment muſt come near the ſore, or even touch

the neighbouring ſound parts. When the cancerous wound is ſmall and free from any offenſive ſmell, it is better ſtill not to uſe any greaſe if it can be avoided; and if we be forced to it, from the dry lint ſticking to the edges, it will be beſt to powder the ſore firſt with flowers of zinc, and lay nothing over but the Goulard cerate, or ſome ſuch mild ointment. Baſilicon or the green digeſtive always add to the offenſive ſmell. Let me be permitted to obſerve by the way, that it might poſſibly be better if theſe digeſtive ointments were baniſhed from the practice of ſurgery, and more particularly from the treatment of ſimple wounds. The ſmell of them is of itſelf very diſagreeable to the patient as well as the ſurgeon, and I am fully perſuaded they are of no uſe. The purpoſe of keeping a ſimple wound moiſt and protected from the air, is as well effected by a little white wax and oil melted together, which to render it pleaſing to the eye, may be coloured with alkanet root. This kind of ointment, the Goulard cerate, and the epulotic cerate, are the only topics I have uſed to ſimple wounds for theſe laſt fourteen years, either in public or private practice. The advantages ariſing from this, are, that the wounds thus dreſſed do not yield ſo great a ſhare of matter, that the granulations are not therefore ſo likely to riſe above the edges of the ſore, that theſe edges themſelves are more eaſily kept clean, and that the dreſſings are not in the leaſt offenſive to the patient."

The author profeſſes to have entertained a conjecture that the cancerous affection is *produced by inſects*, "which," ſays he "induced me to try the application of fixed air to theſe complaints, in hopes that its noxious quality would deſtroy theſe inſects and cure the diſeaſe. But it is an extremely difficult thing to apply mephitic air to cancerous ulcers, in ſuch a manner as to exclude all communication with the external air, upon which circumſtance alone, according to my ideas, its efficacy muſt depend.

"The inequality of the parts on which the apparatus is to be fixed, and ſometimes the extent of the diſeaſe, are obſtacles to the cloſe adapting of it, which in ſome caſes are inſurmountable. Add to this, that a bladder is the only thing that can be made uſe of to contain this mephitic air; for if a hollow glaſs were applied, it is evident that it would act like a cupping glaſs, and become inſupportable upon parts already extremely ſenſible. Doctor Prieſtley obſerves too, that *a bladder, he has found by experience, will not long make a ſufficient ſeparation between ſeveral kinds of air and common air.* Theſe may, perhaps, be the reaſons why the application of fixed air has not ſucceeded with me. Whether the nitrous air diſcovered by Dr. Prieſtley, and which he obſerves to be more noxious than the former, will ſucceed better, muſt be determined by future experiments.

"Such," continues Mr. Juſtamond, "were in general the methods I uſed, in the treatment of ulcerated cancers; beſides which,

upon superficial cancerous wounds, where it was my design to make a slight eschar with little pain, or where I was endeavouring to heal the obstinate remains of a cancer previously brought into a small compass, I used to mix some of the magnes arsenicalis, or even some crude arsenic, with a proportion of opium, and make it into an ointment by the addition of some Goulard cerate or any other mild unguent of the same kind. This was made stronger or weaker according to the effect it was meant to produce. The general rule was to take ten grains of the *magnes arsenicalis* with the same quantity of opium, and mix them with one drachm of soft ointment. This mild application gives little or no pain, and produces evidently good effects. It might, perhaps, prove useful in removing any fresh appearances of the disease, that are apt to arise after extirpation, however carefully or well performed. Indeed, unless the arsenical caustic can be applied so as to eradicate the whole disease in a short time, I should always prefer this mode of using it, not only on account of its being rendered mild by the addition of an unctuous substance, but also because, in this mode of applying it, we can always ascertain the quantity of arsenic used upon any patient in a given time. This is a material circumstance to attend to; for if we are too free even in the external application of arsenic for any continuance, it will be apt to bring on pains in the extremities and other disagreeable symptoms. But in this mode it may be continued for any length of time without danger, for as I always spread the ointment as thin as possible upon the lint, a drachm weight of it will last for several dressings, and that drachm contains no more than ten grains of the magnes, in which there are but five of arsenic. It appears to me, that the disease may always be palliated and the progress of it checked by this kind of mixture; and, perhaps, if it were continued for many months uninterruptedly, to small cancerous sores about the face, it might often effect a cure: but the great length of time sometimes required to pursue the same method with advantage, frequently discourages the patient and the surgeon too, from persevering as they ought. I have had two instances of this, one of a cancer on the nose, the other the noli me tangere above mentioned; both which cases I verily believe, would have been completely cured by a steady perseverence in the use of this mild ointment, had it not been for the restlessness of the patients and their anxiety to return into the country. Nor do I think it necessary to add the opium to the mixture, unless the crude arsenic be used, and that in a larger quantity, for the application is sufficiently mild without it. I shall take this opportunity to mention, that this arsenical ointment is also very useful in some inveterate ulcers, and likewise in scrophulous sores. I was first induced to try it in scrophulous ulcers, from having found among some of Sir Hans Sloane's manuscripts, that the *magnes arsenicalis* was mentioned as a specific against the scrophula. Though I cannot boast of having found it entirely so, yet I have frequently

uſed the magnes alone, or mixed with opium, to theſe ſores, and particularly to the carious parts of bones in them, with very good effect."

We have in ſome degree wandered from our purpoſe, which was, chiefly, to give the opinions and experiments of authors on the internal exhibition of arſenic in cancer. Mr. Juſtamond's concluſion is, "that arſenic is *a poiſon of ſo dangerous a nature*, that it can ſeldom be uſed in ſufficient quantity to bring about the deſired effect, without expoſing the patient to too great riſque. If the arſenic too be not uſed in *ſufficient quantity* to eradicate the diſeaſe, it does *hurt* rather than good; becauſe, after having loſt its quality of an *antidote*, the ill effects of its having acted as a *cauſtic* ſtill ſubſiſt, and the irritation it has occaſioned exaſperates the diſeaſe. For we well know that cancers, when irritated by cauſtic applications of *any kind*, are conſiderably haſtened in their progreſs."

Nevertheleſs, this remedy is not left entirely without an advocate. Mr. Simmons, a ſurgeon of Manchester, addreſſing the Editors of the Medical and Phyſical Journal, ſays: "Two years have elapſed ſince I publiſhed a ſhort account of a caſe of cancer then under treatment, in which the ſolution of white arſenic appeared to have acted as an *anodine*. That caſe, as might be expected, proved fatal, but the remedy did not diſappoint my prediction. I have now a ſecond patient under a courſe of the ſame remedy, where my expectations reſpecting it have been fully realized. The ſubject is a woman, in the 53d year of her age, whoſe left breaſt, adherent to the pectoral muſcle, and in a cancerous ſtate, together with a large cluſter of indurated glands in the axilla, I extirpated in March laſt. The integuments covering a part of the breaſt had become diſeaſed, ſo that union by the firſt intention could not be accompliſhed. Nevertheleſs, the parts healed completely, and for ſeveral weeks ſhe continued apparently well. The return of the diſeaſe was then manifeſted by a ſmall veſication, which terminated in a painful ulcer, about the ſize of her finger nail, in the middle of the cicatrix formed by the operation, and by painful indurations ſurrounding it, and in the courſe of the abſorbents leading to the axilla on the ſame ſide. With the diſeaſe ſlowly advancing, ſhe ſuffered for ſeveral weeks longer before ſhe applied again for help, when ſhe complained of pain all over the ulcerated ſurface, and particularly in the knots, eſpecially when preſſed.

"She had been forewarned of the probable recurrence of the diſeaſe, owing to the too long delay of the operation, which was performed with proper regard to every circumſtance of candour and caution.

"On the 14th of July, when I firſt put her upon the uſe of the mineral ſolution, the ulceration was extending itſelf rapidly, and the pain all over the ſurface of the ulcer was conſtant and very ſevere, as well as in the indurated parts. She had not taken it more than

nine days, in doſes of twelve drops, three times a-day, before ſhe thought the pain ſenſibly decreaſed. To the ulcer itſelf, the ung. ceræ cum opio was directed; but as, after a ſufficient trial, ſhe thought the pain aggravated by it, the infus. cicutæ was ſubſtituted, as in the former caſe.

" It is now upwards of ſix months ſince ſhe began the uſe of the arſenical ſolution, which has been taken in the above doſes with great regularity till within a few days. This ſuſpenſion of it has been recommended on account of a pain in the head, and of an uneaſineſs in her ſtomach, both of which ſhe aſcribes to a monthly conſtitutional change now not outwardly marked; and as they had nearly ſubſided this morning, I am inclined to favour her opinion of the cauſe. Notwithſtanding the ulcerated parts had ſo long ceaſed to be painful, the cicatrization was not much advanced till ſhe came into the Infirmary, where ſhe was a ſecond time admitted an in-patient, under the cancer plan, on the 12th of January, 1801.

" There is now very little ulceration, and the ſkinning is ſtill progreſſively advancing; the pain too, which is not conſtant, is confined to the knots, ſome of which are inflamed, and going to exfoliate. In Graham's caſe it will be recollected, that this was the ſource of pain, after ſhe had for ſome time taken the arſenical ſolution.

" I have purpoſely compreſſed the recital of this caſe, and confined myſelf to the leading points of it; but it muſt be again obſerved, that the ulceration was conſiderable, and very painful.

" The drops were at firſt taken in a little water, but, on account of their ſeeming to diſagree with her ſtomach, it was changed for peppermint-water, which at that time had the deſired effect. Latterly, ſhe has been allowed four ounces of red wine daily; in other reſpects, ſhe has taken only the common diet of the houſe.

" No opium has been adminiſtered, though, when the functions of the ſtomach were diſturbed, I thought it indicated, leſt its exhibition ſhould throw any ambiguity over the reſult; however, I am diſpoſed to think that it may become neceſſary, to enable her to bear the mineral ſolution in proper doſes. Henceforward, I ſhall not ſcruple to employ it, ſhould the ſymptoms require its uſe, in conjunction with the drops. And ſhould chronic general inflammation, which has been ſaid to attend the long-continued exhibition of arſenic, be excited, but which I have not ſeen, the digitalis offers a reſource admirably calculated to repreſs it.

" Theſe are the ſeveral means by which, in the preſent inſtance, I propoſe to combat this formidable diſeaſe.

" Partial ſucceſs has already attended my endeavours, and I expect not to accompliſh a cure. Among the multiplicity of noſtrums for cancer, vaunted by empirics, arſenic is probably the active ingredient; it was formerly much employed, but had, I believe, been diſ-

carded from regular practice. My own experience proves it to be safe, when cautiously administered; for I have given it, in another disease, to a child of fifteen months old, and with success.

"The judicious reader will form his own conclusions from my *two* cases: My own are;—

"1. That arsenic does diminish pain, and promote the healing of an ulcerated cancer;

"2. That it may be safely administered, in proper doses, for a great length of time, without endangering life, or even exciting any of those alarming symptoms which have been said to attend its continued exhibition."

Dr. Mosely writes on this disease in very encouraging terms; with what reason, we must leave to be explained by those who may be disposed to agree with him. It must be considered, however, that he speaks of the disease as it appears in tropical situations.

"Cancers," says he, "are of two sorts; schirrous, or occult, and ulcerated. There is also a *minor* species of cancer, called a *cancerous ulcer*. Cancers are seldomer seen in the West-Indian islands, than on the neighbouring western continent of America. The disease which the Spaniards at *Quito* call *Mal del Valle* or *Vicho*, which is a gangrene in the rectum, and often succeeds fluxes, and sometimes attacks people while they are ill with fevers, is unknown in the islands. So are cancers of the uterus, and an ulcerated cancer, called the *Bay-Sore*."

Of cancers of the uterus (which we shall consider in another place), Dr. Mosely says, "they are always lingering, excruciating, and fatal; and so common in the city of *Lima*, and its neighbourhood, that women suppose it contagious, even from sitting in a chair after an infected person."

"The *Bay-sore*, which," Dr. Mosely observes, "is a *true cancer*, commencing with an ulcer, is endemic at the *Bay of Honduras*. It is frequently seen on the Musquito shore also, and along that part of the continent.

"This disease is also fatal, if *neglected*. But being *within the reach of surgery to remedy*, that remedy is the object of the present discussion.

"Every part of the face, body, and limbs, is subject to be the seat of this disease.

"The cause of it is so little to be ascertained by any reference to the state of the habit of the body, that it is generally supposed to arise from some external agent. The Indians say, that it is produced by a large fly depositing its eggs in the flesh.

"The method of curing this cancer is very simple, though painful. But from the experience I have had, I can venture to assert, that the same method will cure any external cancer whatever, that is curable, in any part of the world, where the application can be

made in such a manner, that the disease and the medicine may be brought into contact.

"The method is this: Spread a plaster of *diachylon with gum*, upon thin leather, the size of the cancer. Suppose the plaster to be as large as a crown-piece, or a Spanish dollar, sprinkle on it a scruple of *corrosive sublimate of mercury* finely powdered; and so in proportion to a larger or smaller plaster. This plaster must be applied to the cancer, and remain on it forty-eight hours; but if there be any apprehension that it has not done its office in that time, it must remain longer. Then take it off, and apply a poultice of bread and milk, with a little olive-oil, which must be renewed frequently, until the cancer comes entirely out, by the roots as it were. The part is then to be dressed, digested, and cured as a common ulcer. A purge or two with *calomel*, must precede the application. No other preparation is necessary, in habits otherwise healthy. But when the patient is gross, or in a bad state of body, as in all other cases, he must be properly prepared for the operation. *Bark* is sometimes necessary, to forward the digestion and cure."

Dr. Mosely says this method was practised, to his knowledge, by a person who lived many years, and was in extensive practice, and in great reputation, of course, for curing cancers, at the *Bay of Honduras*. "It never failed him," says the doctor, "in *many hundreds of cases*. He there extracted one, which weighed eleven ounces, from the inside of a man's thigh; and completed the cure in four weeks.

"It is surprising to see how entirely corrosive sublimate, thus applied, will separate the unsound from the sound parts; and let the figure of the cancer be what it may, and its ramifications ever so numerous, the whole diseased part, if within reach of the application, will be detached, and come away all together, leaving the cavity clean, and frequently free from the smallest remains of diseased flesh. This is extracting a cancer, and I believe there is no other way of curing any genuine cancer, except by extirpation with a knife."

"Cancerous detached and single glands, and tumors much diseased, but not ulcerated, may be extracted in the same manner. But should the tumor be deeply seated, before the application, the cuticle may be removed on the preceding day, by a blister, or by a slight rubbing with a caustic, to the extent and dimension intended to be acted on: in superficial tumors this is not necessary. If the tumor be only ulcerated in the middle, it will be necessary to circumscribe the whole induration, and sometimes, though rarely, it may be necessary to put a little of the powdered sublimate round the circumference of the diseased tumor, when it begins to loosen, should any part adhere obstinately, to hasten its separation from the sound flesh.

"*Arsenic* will not produce the salutary effects, obtained by corrosive sublimate. I have tried it by every mode of application, in consequence of the reputation it has undeservedly borne, in cancerous diseases.

" I have frequently found, in extirpating a cancerous or ſchirrous tumor in the breaſt, and other parts, where there has been a chain or knot of ſmaller indurations leading from it, that the application of this plaſter to the principal ſeat of the diſeaſe, has deſtroyed the other ſwellings; partly from the adjacent inflammation, and partly, either from the mercury in the act of abſorption, paſſing through theſe glands in following the courſe of the lymphatics, while penetrating the ſyſtem, or from its peculiar influence on this ſeries of veſſels.

" As a proof that corroſive ſublimate thus applied, pervades the whole habit, the mouth is generally affected with the mercurial taſte and fetor; and ſometimes the ſalivary glands are conſiderably affected, and ſalivation is raiſed, particularly when the application is conſiderable, and made to the breaſt.

" In cancers, every thing depends on the mode of applying the ſublimate as I have deſcribed. Yet, beſides the ſolubility of ſublimate, there is a ſpecifical difference between the corroſion of ſublimate and that of arſenic. Arſenic applied alone, or quickened with the addition of ſublimate, to old ulcers, for example, to deſtroy fungous fleſh, which in leprous and leucophlegmatic habits is frequently ſo quick of growth, and ſo enormous in hot climates, that no other application but the knife is equal to its removal, rots indiſcriminately the ſound and unſound fleſh wherever it comes in contact. It therefore requires great care in the application. I have known it, when injudiciouſly applied, to eat down to a large artery, and occaſion the loſs of a limb. Corroſive ſublimate uſed to the ſame end, though an improper application, will not cauſe the ſame miſchief; for in theſe caſes, though it may cauſe great inflammation, it is bounded in its corroding action by healthy fleſh; or acts on it but ſlightly as a deſtroyer.

" Arſenic has a tendency to *deaden*, and deſtroy the functions of organiſed parts. Corroſive ſublimate to inflame thoſe parts, and increaſe the circulation of their contents. Thus the irregular and imperfect attachment of diſeaſed glands, or any morbid body ſurrounded by healthy fleſh, is broken, and the part itſelf expelled from its ſituation, by means, imitative of thoſe which nature always aſſumes, through the operation of locally-excited action.

" Surgeons have never known but two topical modes of treating inveterate cancers. One by amputation; the other by *corroſion*. The firſt is often impracticable, and the latter always *dangerous* *.

" Empirics have ſucceeded better. Their method is to extract them. I have ſeen many of theſe itinerants, in different countries, extract cancers with the greateſt facility. And before I knew that

* How does the ingenious phyſician, to whoſe labours we are ſo much indebted, reconcile this aſſertion with the practice he is recommending? Does not *muriated quickſilver* act, topically, by *corroſion*? The very name by which he has choſen to diſtinguiſh it conveys that idea.

the only application, however diſguiſed, which could produce ſuch a wonderful effect, was corroſive ſublimate, I had tried every kind of mineral and vegetable preparation that could be thought of without ſucceſs."

Dr. Moſeley here obſerves, that Mr. Juſtamond was miſtaken in his theory of the effects of arſenic, as ſpecifical in cancers*. "His conjectures," ſays the doctor, "which he had adopted from others, that cancers are '*produced from inſects, or the germina of them, taken up from the air by the lymphatic veſſels*,' as a mere hypotheſis, were well ſupported: but when proof is required, the beſt arguments, alone, are invalid."

The author thinks it neceſſary to add the following admonitions and cautions, reſpecting this mode of treating cancers:

"Bringing the power of the mercury," ſays he, "into contact with the diſeaſed parts, being neceſſary for their extirpation, it is certain that the application is moſt ſucceſsful in local cancers, affecting a ſimple gland, or ſome cartilaginous or muſcular part: and that in large maſſes of glands, breaſts of women, and parts where there is no aſcertaining the bounds of the diſeaſe, and where the cavities or communications may be deep, irregular, and extenſive, its ſucceſs muſt be precarious. And as ſublimate externally applied is violent in its action, anatomical knowledge and medical judgment are required, to determine whether the diſeaſe be within the reach of its effects, and the patient a proper ſubject for its application. Otherwiſe it may not only be applied in vain, but highly injurioufly; and when to a large ſurface, in delicate and irritable habits, it may excite inſupportable pain, dangerous fever, commotions in the nervous ſyſtem, and convulſions."

From the incurable nature of cancer, in its advanced ſtate, it becomes a deſirable object to avail ourſelves of any means by which, in an incipient ſtate, it may be got the better of. In the Memoirs of the Medical Society of London, Mr. Fearon, a ſurgeon in London, has publiſhed an account of the good effects of repeated bleeding in ſuch caſes.

"If," ſays he, "I venture to hazard the opinion I have for ſome time been inclined to entertain of *inflammation being the cauſe of cancer*, or, in other words, that it is always *connected with* the diſeaſe in a greater or leſs degree, it is more with a deſign to excite the opinions of other practitioners, than from the vain attempt to elucidate perfectly a complaint hitherto enveloped in obſcurity. For from obſtructions, external injury, &c. inflammation in ſome degree

* AVICENNA certainly gave *arſenic* internally, for ulcerations in the lungs. He ſays, in Lib. II. Tract. 2. there are three ſorts of *arſenic*; white, yellow, and red. Of the laſt he ſays, "datur ad potandum, inflatis cum aumeli, et hydromelle, et aſſumitur, cum gumma pini, ad *Tuſſim antiquam, et ſputum ſaniei et ſanguinis*: et quandoque ponitur in pilulis, quæ ſunt ad aſthma."

enſues; and I am inclined to think, that were we to treat cancerous complaints, at an early period, as proceeding from inflammation, without entering into whimſical or abſtruſe reveries concerning the remote, latent, or predisponent cauſe of cancer, we ſhould be much more ſucceſsful in practice. To this opinion and practice I was led by the incident I have mentioned in the firſt of the following caſes; and judging that, from the ceſſation of the menſtrual evacuation, there would, for ſome time after, be a greater quantity of blood in the conſtitution than it had been accuſtomed to bear, I thought advantage would be derived from ſubſtituting an artificial evacuation, inſtead of that which had ceaſed.

"On this head I decline entering into the doctrine of plethora; being ſolicitous only to throw even the ſmalleſt ray of light on the practical part, leaving the theoretical to thoſe of ſuperior abilities, to whoſe department it more properly belongs*; and the more I reflect on all the practice I have ſeen, the more it tends to confirm me in this opinion; for in all caſes where I have ſeen ſolanum, mercury, martial flowers, or arſenic, given, they did harm; and if from cicuta or opium any advantages appeared to enſue, they were but of ſhort duration.

"The cure is very ſimple; and conſiſts in bleeding, either topical or general, according to the ſeat of the complaint, or part affected.

"In the beginning of ſcirrhous affections of the breaſt and teſtis, the mode I have adopted of taking away blood, is by *leeches repeatedly applied to the parts*. In this courſe, however, I have often been interrupted by the topical inflammation produced by theſe animals around the parts where they faſtened. In delicate female habits I have often loſt a week before I could proceed to the re-application of them. When the ſymptoms lead me to ſuſpect the ſtomach, uterus, or any of the viſcera, to be ſo affected that the complaint either is, or moſt probably ſoon will become, cancerous, I then have recourſe to general bleedings; but whether topical or general, perſeverance for a ſufficient length of time is neceſſary. Though the pulſe never indicated ſuch practice, yet the patients have not ſuffered by repeated bleedings; on the contrary, when they paſſed a certain time of loſing blood, they felt a return of their ſymptoms, and of their own accord deſired to be bled again. To this plan, or practice of repeated bleedings, I joined a milk and vegetable diet; avoiding

* That inflammation is either the proximate cauſe of cancer, or always attends it, I am ſtrongly inclined to believe; but whether this inflammation reſults from plethora, from obſtruction, from the ſtructure of the part, or from ſome particular excitement therein, I do not preſume to determine. If it can be made appear that bleeding has removed a cancerous diſeaſe, I ſhall content myſelf with the importance of the fact; leaving the ſolution to phyſiologiſts. And the more I reflect on all the practice I have ſeen, the more it tends to confirm me in the opinion that it has produced, and is capable of producing, under certain circumſtances, this very deſirable effect.

wine, ſpirits, and fermented liquors, an open belly, and ſaturnine applications. I will give ſome caſes, by way of illuſtrating the practice more to the reader's ſatisfaction.

Case I. "A poor woman, about fifty years of age, was admitted a patient at the Surrey Diſpenſary. She ſaid ſhe had long been in a bad ſtate of health; the cauſe of which ſhe could not attribute to any irregularity in living. She was of a delicate habit of body, and not accuſtomed to the uſe of ſpirituous liquors. She ſuſpected that her complaints originated from her having been expoſed for ſome time to the inclemency of the weather, in 1785, in an open yard, as ſhe found herſelf generally indiſpoſed at that time, and went to bed, having taken ſomething warm, with the view of promoting the uſual diſcharge (of which ſhe had not any appearance for ſix weeks), and alſo to relieve a ſickneſs and pain at her ſtomach and back; ſymptoms which ſhe ſuppoſed to have ariſen from the obſtruction of her menſes. But in this flattering hope ſhe was much diſappointed, as they never after appeared, and her pains continued gradually to increaſe, and (to uſe her own words) extend all over her bowels, particularly after eating. Theſe ſymptoms continued without any intermiſſion (except of a few days at times) for ſixteen months; during which time ſhe had repeatedly applied to ſeveral regular, as well as itinerant practitioners, without meeting with the leaſt relief. Vomits, bliſters, purgatives, and every other remedy that had been tried, only increaſed her complaints.

"In the ſummer, 1786, I firſt ſaw her at her lodgings in the Mint, with her head and ſhoulders raiſed; reſpiration being difficult. She was moſt amazingly reduced in fleſh; her urine was ſmall in quantity, and high coloured; ſhe complained of thirſt, was coſtive, her pulſe ſmall and frequent. Her complexion was of a cadaverous hue; ſhe complained of cold fits, attended with ſhiverings, and of a ſwelling on the right ſide of her belly; on examination of which I found the abdomen was conſiderably diſtended by the diſeaſe, which I diſtinctly felt conſiderably indurated. As I have already obſerved, ſhe was very much emaciated; her appetite had been on the decline for ſome time before I ſaw her; no ſolids would lie on her ſtomach, as a vomiting enſued ſoon after eating, attended with a diſcharge of blood, and very acrid offenſive matter. Purgatives had the ſame unhappy effect, ſo that her body was neceſſarily kept open by clyſters only; and ſhe was nouriſhed by liquids. All theſe ſymptoms increaſed for ſome time after I ſaw her; when death eaſed her of the load of life, and freed her from ſufferings that exceed all deſcription.

"Leave being obtained to open the body, the ſtomach was found to be the part diſeaſed. The great extremity was of a natural appearance, but contained a great quantity of a chocolate-coloured fluid, ſo extremely offenſive, that the ſmell of it produced immediate ſickneſs, even to thoſe accuſtomed to every kind of diſſection. The

middle of the ſtomach, ſmall extremity, and pylorus, formed a compound maſs: which was cloſely united to all the neighbouring parts. On the middle and fore part of the ſtomach there was an ulcer of about the ſize of half a crown, with uneven ragged edges; through which ſome of the fluid was diſcharged into the cavity of the abdomen. The duodenum, ducts, and gall bladder, all adhered ſtrongly to the liver, and formed a maſs of great ſize. On being laid open, it diſcovered an extenſive cavity, with large cancerous knobs appearing on its ſurface; but whether this was the original cavity of the ſmall extremity of the ſtomach, or of that part of the duodenum running in its neighbourhood, or of the general adhering maſs deſtroyed by internal ulceration, is difficult to ſay."

On this caſe Mr. Fearon makes the following remarks. "The narrative of a caſe which is beyond the reach of our art, is not a pleaſing undertaking. A cancer of the ſtomach is one of thoſe melancholy caſes which is beyond the ſkill of the moſt eminent of our profeſſion: yet, as it is the duty of practitioners to avail themſelves of every opportunity of determining the preciſe nature of diſorders by diſſection, and of communicating them to the public, this caſe, and four other cancerous affections of the ſtomach, in my collection of diſeaſes, any gentleman of the faculty, who will do me the honour of calling at my houſe, may examine. They are much more extenſive than any I have met with in any other collection, or read of either in Morgagni, Bonetus, or any other. Theſe caſes, therefore, may not be unacceptable to the Society, eſpecially as I flatter myſelf I have by accident been able to throw ſome light on the nature, treatment, and prevention, of this loathſome diſeaſe; which I ſhall give in a brief ſtatement, juſt as the facts occurred.

Case II. "In the year, 1784, a lady in Clifford-ſtreet conſulted me about a lump ſhe had juſt diſcovered in her right breaſt. The firſt ſymptom, ſhe ſaid, was a ſtretching fulneſs in the part, attended with an oppreſſion at the ſtomach. As theſe complaints were but ſlight, and exactly ſimilar to thoſe ſhe had been accuſtomed to preceding the appearance of her menſes, or what uſually ſucceeded conception, ſhe did not think it neceſſary to take an opinion of her caſe for a fortnight afterwards, when an increaſed hardneſs, attended with a darting pricking pain, particularly after being handled, very juſtly alarmed her. She was forty-nine years of age, and had no appearance of the catamenia for ſix weeks before ſhe had perceived the lump; which was clearly a ſcirrhus forming, that muſt in a little time require an operation. Between the ſeventh and eighth week from the former appearance, ſhe had a plentiful flow of the catamenia, which laſted longer than uſual; during which time the lump ſubſided, and the pain went off entirely. We were agreeably ſurpriſed, and attributed the cure to the return of the menſes; and we agreed, when theſe ceaſed entirely, if her complaints returned afterwards, to ſubſtitute bleeding, to the amount of three or four ounces,

every six weeks or two months; to keep her body open, and make her live abstemiously; by which she has remained free from a relapse these three years."

Mr. Fearon here assures us that he has met with many other cases, where, at the cessation of the menses, a similar treatment has proved successful. He proceeds to relate,

Case III. "Elizabeth Robinson, being admitted a patient at the Surrey Dispensary, in April, 1784, said she kept a coal-shed in Bermondsey-street; and that she had for six months been afflicted with a swelling and pain in her breast; that she heard it was cancerous, and desired some assistance. The tumor was incompressibly hard to the touch, and gave her very acute pain after being handled; the nipple was contracted, and the veins of the skin varicose; the lancinating and darting pains increased with the disease. Being perfectly satisfied that it was a true scirrhus, I put her under a course of cicuta in as large quantities as she could possibly bear; guarding against its narcotic effects, and applying lead water externally. By these means, and a proper regimen being observed, she thought herself relieved for a time; but at the end of eight weeks, not receiving a cure, she became tired of my prescriptions, gave up her letter of recommendation unknown to me, and I heard no more of her for two months, when she returned and gave me the following account; viz. she had been informed that the gentlemen of the Westminster Infirmary were famous for the cure of cancerous complaints; that she had been two months under the care of Mr. Justamond, without experiencing much relief, and therefore was returned to submit to whatever I thought proper. I immediately took her under my care, put her upon a milk and vegetable diet, and ordered four leeches to be applied every second day. This plan soon produced a diminution of the size of the disease, pain, and all its concomitant symptoms; and in nine weeks she returned thanks to Mr. Johnson, the governor, who recommended her, being perfectly cured. From the loss of blood she became very thin and pale, insomuch that her acquaintance apprehended she was become consumptive, and advised her not to lose any more blood; but the uncommon benefit she experienced induced her to persevere, and she soon recovered her health and vigour; which she has enjoyed, without the least interruption, ever since.

"In a conversation with Mr. Justamond upon this case, he candidly acknowledged he had given the martial flowers and corrosive sublimate, without the wished-for success.

Case IV. "I was consulted by Mr. ——, aged 51, for a scirrhus of the testicle, which had been two years forming; during which time, the size, weight, and pain, had considerably increased. The spermatic chord was a little thickened, and the testicle hard and considerably enlarged. The darting pains were so frequent at times, as to deprive him of his natural rest. The case having been sus-

pected to be venereal, he had been put under a well-conducted courſe of mercury for five weeks; which only increaſed his complaints. Being an inhabitant of Colcheſter, ſea-bathing was fully and fairly tried without the leaſt good effect, on the ſuppoſition that his diſeaſe was ſcrophulous.

"On his application to me, I did not entertain a doubt concerning the nature of his complaint; and therefore ordered ten ounces of blood from the arm, and leeches to be applied to the part at leaſt thrice a-week. To this I joined an abſtemious regimen, and kept his body open. This plan was continued only ten weeks (during which time he was occaſionally ſeen by Mr. Hamilton, Mr. Beal, an India ſurgeon, and Mr. Day of Colcheſter), when he was perfectly cured."

As it is ſtill the opinion of many practitioners, that the cicuta bath ſhould be had recourſe to in cancerous diſeaſes, we ſhall conclude this chapter with the following remarks of Mr. Juſtamond, and other writers, upon that ſubject.

"Some of the firſt caſes of ulcerated cancers," ſays Mr. Juſtamond, "in which I had an opportunity of trying the hemlock bath, were in the Weſtminſter hoſpital. It will be needleſs to tire the reader with deſcriptions of ſimilar caſes; but I ſhall principally refer to two of theſe patients, becauſe they lived the longeſt, and thereby enabled me more particularly to note the effects of the method. Theſe two caſes were of long ſtanding, the patients advanced in years, and the appearances of ſuch a nature, as not to afford any proſpect of ſucceſs from the uſe of the knife. In both theſe inſtances, the firſt effects of the hemlock bath uſed with a large quantity of the plant were the ſame. A high ſymptomatic fever enſued, attended with rigors, great increaſe of pain, and every ſymptom of an advancing ſuppuration. I was not alarmed by theſe ſymptoms, and endeavoured, not only to quiet the apprehenſions of my patients, but alſo to mitigate their ſufferings as much as poſſible. In a ſhort time the ſuppuration was far advanced, and affected not only the ulcerations, but extended alſo to every part that ſeemed tainted with the diſeaſe, which ſoon came away in large ſloughs, accompanied with great abundance of matter. The pain my patients already ſuffered, and the extreme ſenſibility of the parts, hindered me from uſing any dreſſing but dry lint or ſoft Goulard cerate to the edges; for, to ſave the fatigue of long dreſſing, even the application of my liquid was omitted. To ſay the truth, I flattered myſelf, from all the appearances, that nothing more was wanting than a little attention to complete the cure. The firſt of theſe patients, Elizabeth Williams, admitted into the hoſpital on the 23d of September, 1773, ſoon recovered eaſe and ſtrength, and in about three months from her admiſſion, the ulcer was apparently reduced to the ſtate of a ſimple wound, which every one imagined, as well as I, would heal in a ſhort time. She uſed to riſe and walk about the ward in perfect

eaſe, and to all appearance, in perfect health. She was, however, ſuddenly ſeized with a putrid fever, which carried her off in a few days, at the end of about four months from her firſt admiſſion into the hoſpital. All I ſhall obſerve on this circumſtance is, that the illneſs was ſudden, and the iſſue of it ſpeedy; and that during the little time it laſted, there was no pain complained of in the breaſt, nor was there any alteration in the favourable appearance of the ſore and the parts ſurrounding it, though the cicatrix was never completely formed.

"In the other caſe, which was that of Mary Randall, a woman about 60 years of age, who was admitted into the hoſpital on the 15th of December, 1773, the event was different. After the large ſloughs, cauſed by the ſuppuration of the diſeaſed parts, were ſeparated by the uſe of the hemlock bath, which happened in about three months, every thing went on well, though ſlowly, for a conſiderable time. My patient enjoyed eaſe and health for about ſix months: but the wound never healed kindly, and ſome diſagreeable appearances began to ſhew themſelves, both in the ſore and on the edges."

The cicuta bath hath been made uſe of in caſes of cancer, and ſometimes appears to have been of ſervice. Dr. Hamilton mentions a caſe ſuppoſed at firſt to be venereal, but which afterwards turned out to be a true cancer. In conſequence of the miſtake concerning its nature, mercury had been exhibited with the very worſt effect. The patient had been originally of a ſcrophulous habit, at leaſt allied to thoſe who were ſo, and from his infancy ſubject to a red cuticular eruption. The diſeaſe attacked the ſcrotum, where it produced an ulcer of an inch and a quarter in length on the right ſide, and in a longitudinal direction with the ſpermatic cord. The lips were hard, jagged, and but little elevated, the cutis vera was deſtroyed, when he came under Dr. Hamilton's care, and the ſore appeared of a red and fiery colour. In conſequence of his ſuppoſing it to be venereal, mercury was exhibited both outwardly and inwardly; and ſo eaſily was the patient affected with it, that a ſalivation was on the point of being produced very rapidly; ſo that the exhibition of the mercury was frequently interrupted, and the decoctions of ſarſaparilla and mezereon only continued, which had been given along with the mercurials from the beginning. Under this courſe the ulcer daily became worſe, ſo that in ten days the ſpermatic cord was laid bare, notwithſtanding the uſe of opium, hemlock, and carrot poultices, &c. In eight days more, the ulcer had paſſed acroſs the root of the penis, and reached the left ſide of the ſcrotum, and in its paſſage conſumed not only the ſkin and adipoſe membrane, but an inch of the corpora cavernoſa; the whole penis alſo becoming very much inflamed and turgid. Finding matters in this ſituation, the doctor laid aſide the uſe of mercury, and in its ſtead exhibited opium, extract. cicut. along with the bark; but all to no purpoſe; the de-

ſtruction of the penis appearing to be certain, and even the life of the patient in the utmoſt danger. Recourſe was now had to the cicuta bath, which was prepared in the following manner. Half a pound of the ſeeds of cicuta vulgaris were tied looſely in a bag, along with four large handfuls of the leaves and flowers; after which they were boiled in a copper veſſel in ſeven pailfuls (8 Engliſh gallons) of water, till the quantity was reduced to ſix. The whole was now put into a wooden trough, along with twelve pailfuls of cold water, and in this the patient continued immerſed to the arm-pits for the ſpace of fifteen minutes. By the very firſt bathing the pain was leſſened, and the progreſs of the ulcer ſtopped. The ſecond not only diminiſhed the diſcharge, but changed its appearance, ſo that, from being ſanious and fetid, it became purulent. As the ſore mended, the time of the patient's continuance in the bath was augmented to half an hour or more; and ſo rapidly did the cure now proceed, that in a month's time from the firſt uſe of the bath he was quite well. The doctor remarks, that in this caſe the ulcer did not heal up like wounds or abſceſſes, with granulations of new fleſh, but the ſides of the ulcer contracted every day until they became contiguous, after which they united from the bottom upwards; the cicatrix thus aſſuming a puſſed up and unſightly appearance.

Where the cancer is ſituated in ſuch a manner that the bath cannot reach the part affected, Dr. Hamilton recommends the application of the decoction by means of ſyringes. In the caſe of a cancer of the rectum, it was directed to be applied by means of a long flexible tube during the time the patient was in the bath, ſo that he might have the benefit of the medicine both internally and externally. Thus, the decoction may be conveyed into the vagina, or even into the uterus itſelf, or into the bladder, in all which parts of the body cancers moſt commonly, if not always, prove fatal.

In the fourth volume of the Medical Obſervations, we have an account of a ſchirrous tumor in the right breaſt of a lady, which ſeems to have been more of the true carcinomatous nature than the foregoing. It had firſt made its appearance in the left breaſt, but diſſolved after a continuance of ſome years. From this time ſhe had pains in her right breaſt, for which ſea-bathing and other remedies were tried in vain. A tumor was then perceived in the breaſt, which by degrees ſhewed itſelf to be of a cancerous nature. At the time the cicuta was entered upon, the tumor extended about four inches in diameter, was hard, and fixed to the ribs; the ſkin was of a deep purple colour, and corrugated, but no ulceration had taken place. She took the cicuta internally in ſuch quantities as to affect her head, and the breaſt was fomented with a decoction of it; but, notwithſtanding this, and the uſe of other powerful remedies, an ulceration took place in the large tumor, and another ſchirrus, about the ſize of a pigeon's egg, appeared in the axilla. The extract of

the cicuta, which ſhe had hitherto taken, was then changed for the powder, but with no better ſucceſs; the ulcer continued to ſpread, and the ſanious diſcharge was ſo intolerably fetid, that the ſmell of it ſeemed to the patient herſelf to be more grievous than all the pains ſhe endured. This, however, was moſt effectually removed, by the application of a carrot poultice, though no ſtop was put by this, or by increaſed doſes of the cicuta, to the ſpreading of the ulcer. Recourſe was therefore had once more to the external uſe of this medicine, and with great ſucceſs. By injecting a ſtrong decoction of the plant into the ſore, continuing the uſe of the carrot poultice at the ſame time, the ulcer became, in a few days, quite clean and florid; and the diſcharge, from being quite tough and viſcid, ſo that it could not be got off without much difficulty and pain, aſſumed a proper colour and conſiſtence; and in ſix weeks from the application of the cicuta externally the ſize of the ulcer was leſſened, from four inches in diameter, to leſs than the ſize of an almond.

At Guy's hoſpital the following preparation of hemlock is exhibited internally.

(No. 35.) ℞ Succi cicutæ ſpiſſati unc. ſs.
Pulveris herbæ cicutæ q. ſ. Fiant pilulæ lx.

On the medicinal properties of hemlock, a great diverſity of opinions have been maintained, and for this there is a mode of accounting, of which few perhaps are aware. According to ſome writers, but more particularly Dr. Withering, there are ſeveral ways in which the views of a medical practitioner in preſcribing this remedy may be fruſtrated. The plant choſen for preparing the extract may not be the true *conium maculatum*, which is diſtinguiſhed by red ſpots along the ſtalk. It may not be gathered when in perfection, namely, when beginning to flower. The inſpiſſation of the juice may not have been performed in a water-bath, but, for the ſake of diſpatch, over a common fire. The leaves, of which the powder is made, may not have been cautiouſly dried and preſerved in a well ſtopped bottle; or if ſo, may ſtill not have been guarded from the ill effects of expoſure to the light. Or, laſtly, the whole medicine may have ſuffered from the mere effects of long keeping. From any of theſe cauſes, it is evident, the powers of cicuta may have ſuffered; and it happens, no doubt, very frequently, that the failure of it ought, in fact, to be attributed to one or other of them.

We cannot conclude what we have to offer on the ſubject of cancer, without cautioning the junior practitioner againſt giving implicit credit to the repreſentations of noſtrum venders, among whom (*proh pudor!*) we occaſionally obſerve ſome members and graduates of learned colleges.

One of the moſt common deceptions practiſed by ſuch men is that of giving the name of a "cancer" to ſome other diſeaſe ſituated in a part which is obnoxious to cancer, as the female breaſt, &c.

An inſtance of candour, worthy of being imitated, occurs in a communication made to the Editors of the Medical and Phyſical Journal, by Mr. Oliphant, a London practitioner, who relates the following caſes.

CASE I. "Mrs. Oſborn, now aged 57, wife of Mr. Oſborn, breeches-maker, South-ſtreet, Mancheſter-ſquare, nineteen years ago, received a puſh on her right breaſt, and ſoon after a violent preſſure from an iron rail. Conſiderable pain was felt from the laſt, and a hardneſs left, with tenderneſs to the touch. In ſome ſhort time, there aroſe a puckering of the ſkin all around the hardneſs; in time the furrows became exceſſive, all concentric to the induration, and compared by her to *binding ſtrings*.

"Inflammation ſupervened, all the breaſt appeared compriſed in it; ſuppuration came on, and ſeparated the induration from its ſurrounding attachment to the breaſt. This proceſs was accompanied with cold ſhivering, ſickneſs, and vomiting, as happens ordinarily in ſuppuration and extenſive ſloughings. When the ſeparation was complete, the indurated portion came out, according to her term, like a cork, leaving a gaping hole.

"After the expulſion of the diſeaſed portion, the puckering ſkin unfolded to paſs into the cavity; the ſkin crept in, becoming inverted. The ulcerated ſurface was very little ſenſible, but the breaſt was very ſuſceptible and tender. From the cavity, exceſſive hæmorrhage enſued, happening particularly in the night, ſo as to deluge the bed-clothes, and reduced her to extreme weakneſs.

"During the ulcerating proceſs a cupful of cliver-juice was drank every morning, when it could be had; and malt infuſion in the different ſtages of fermentation with yeaſt, made in a jar, to her victuals, and to an unlimited quantity.

"The glands in the axilla were greatly enlarged during the proceſs of induration and ſeparation; and the band of communicating lymphatics was very ſenſibly increaſed. The arm was ſwelled, of a cumbrous weight, and rendered almoſt entirely uſeleſs.

"Seven years ago I ſaw her; the communicating lymphatics between the breaſt and axilla were alone in a condition of ulcer; the breaſt was entirely abſorbed, and gone, but the axillary ſwelling continued conſiderable.

"She had for ſome time uſed an ointment of oil, wax, and roſin (the ointment in common uſe with the pretenders to cure cancers), which I wiſhed her to continue, as well as her other plan. The ſwelling of the arm and in the axilla gradually leſſened and diſappeared, and the ſore by degrees healed, and has been well for five years paſt.

"There was ſome reaſon to believe, that the change which took place in her breaſt was owing to ſupervening febrile affection occurring two or three times in the autumn, attended with cholera morbus

to a dangerous degree; her breaſt was in its worſt ſtate at this time; and ſince its cure, ſhe has been free from ſuch attacks.

CASE II. "Mrs. Craib, of Tottenham-court-road, aged 46, has had three children, the laſt fifteen years ago; was never able to ſuckle with the left breaſt, but had no great inconvenience from this circumſtance. The menſes hitherto regular, till pleuriſy ſeized her; otherwiſe ſhe was extremely healthy, and conſtantly employed in an active life.

"Two years ago ſhe got a violent bruiſe on the upper part of her left breaſt; the effects ſubſided as well as they uſually do in common caſes, only there was left ſome hardneſs with a little occaſional pain.

"Six months after ſhe received another bruiſe on the ſame part, and all the conſequences of contuſion, ſwelling, livid colour, and pain, were greater than in the former accident; and the remaining pain was more ſevere, and the hardneſs of greater extent. In the recent ſtate, repeated applications of leeches were ordered; and when the active condition of the diſeaſe was ſuppoſed to be removed, ſome ſaponaceous camphorated embrocation was applied.

"At this time the hardneſs was detached, and moveable from the general glandular ſtructure of the breaſt, when ſhe went under the care of a friend, not of the profeſſion, but who was a cloſe reader of medical books; he had culled from thence active applications, but of courſe applied them at random. The intention was to procure ſuppuration in the hardneſs, after means of diſcuſſion had failed; and one application was a poultice of pigeons' dung, that produced exceſſive burning and moſt excruciating pain, which, however, I believe, changed totally the diſeaſed condition, but increaſed its extent. It now reached over much more of the breaſt, and made the whole a conſolidated maſs of diſeaſe, and attended with an extended irritation to the axilla and other breaſt, wherein enlargements aroſe.

"The next perſon under whoſe care Mrs. Craib fell, was a man who kept a chandler's ſhop in her neighbourhood, and had been a porter to a ſurgeon. He had the boldneſs to pronounce his new patient curable in ſix weeks, and that he would ſet about it. He began his courſe by ſprinkling it with a white powder, ſuppoſed burnt alum, which excited much pain, and covered the whole with a favourite ointment that he always carried away with him. This would not do, but he ſaid, it was only preparatory to ripen for the knife.

"Mrs. Craib now got a recommendation to an eminent and experienced ſurgeon, who directly ſaw the marks of bad treatment in her breaſt, and expreſſed aſtoniſhment, hearing her caſe, that ſhe had not had regular aſſiſtance, and offered his ſervices of recommendation to a public inſtitution, which, however, ſhe declined accepting.

"She was depreſſed with the proſpect before her, and tormented with ſhooting throbbing pains, particularly at the upper part of the

breaſt, attended with an oozing, irritating ſanies, that excoriated as it extended. There was an ulceration below the nipple, about the ſize of a ſhilling, and one above of about half the ſize, with jagged edges, covered at the bottom with a tomentous ſlough, of a yellowiſh colour. The ſkin ſurrounding the ulcers was level with the reſt of the breaſt.

"In addition to the above, when ſhe firſt applied to me, the whole breaſt was a dark red conſolidated tenſe maſs, much like a large carbuncle, firmly fixed to the cheſt, and ſhe had a ſwelling in the armpit the ſize of a pullet's egg; chronic inflammation had ſeized ſeveral cuticular glands around, particularly between the breaſts, and moſt in the upper part. There was an adventitious hardneſs in the other, which, ſhe ſaid, aroſe from the painful application to the ulcerated one: I dare ſay it would have weighed three-fourths of a pound.

"In ſome places there were interſtitial ſuppurations; a round hole with matter on the ſurface that could not be wiped away, reſembling ſea-ſcurvy, as happens in habits who have ulcers, particularly in the legs; there are often ſuch ulcerations of the ſkin, at different diſtances.

"Her hands were affected with ſlight rhagades, and her left arm was conſiderably ſwelled; her pulſe was quick, but, I believe, not too frequent; her health conſtitutionally unimpaired, and perfectly regular. She ſlept well without an anodyne; and, in ſhort, had nothing to complain of but her ulcerated breaſt, and ſwelled weak arm, never feeling any affection from the other breaſt.

"She put herſelf under my care the 8th of June laſt, and, to allay the irritation ariſing from improper applications and want of dreſſing, a ſedative opiate ſolution was applied to the ulcerations, and I covered the whole breaſt with ſoap cerate: ſhe was directed to take a doſe, and repeat it occaſionally, of magneſia vitriolata, and daily, three times a-day, four ounces of the aqua mephitica alkalina, and to bleed the moſt tenſe part with leeches. This had the deſired effect in removing the ſuperinduced irritation; and, on a ſubſidence of the ſwelling, there was a ſloughing, and ſtench from the ſore: but I was obliged to change this application for the fermenting poultice, and this application was continued to the 18th, with the intended effect. The ſore was as eaſy as ſuch a diſeaſed ſurface almoſt in any caſe could be ſuppoſed to be. The tenderneſs in the axilla was reduced; from not being able to bring her arm to her ſide, for ſome time paſt, nor lie on that ſide, ſhe could nearly do both; the choppings were much leſſened, and ſhe felt herſelf able to attend conſtantly her ſhop, and had good nights' reſt. A favourable circumſtance alſo was, that no bleeding attended on this ulceration; as the whole breaſt, and its veſſels, appeared enveloped in ſuch diſeaſe, that I ſhould have had little reaſon to expect their contracting to reſtrain hæmorrhage if it had occurred.

" Having received a circular letter, in common with others in the profeſſion, from Dr. Niſbet, ſignifying he intended to confine his practice to the treatment of cancer, ſcrophula, and phthiſis, I had the conſent of Mr. Craib to have his advice, on the 18th of June, and he preſcribed a grain of opium every night, a common drink of a ſmall portion of fixed vegetable alkali and ſulphur, diffuſed in water, and a ſulphurated opening electuary; the breaſt to be dreſſed with ſimple cerate; and he ſaid that it was a hopeleſs caſe, and that nothing could be done but palliation.

" However, he wiſhed to give her an antimonial alterative pill, of his own preparation, which I admitted of, wiſhing to wave delicacy for the poſſible benefit of my patient; but ſhe only loſt ſtrength. Hopes of ſuppuration in the principal part of the diſeaſe were entertained, but it did not happen.

" She ſoon was obliged to keep her bed-room, and ſpent much of her time in bed; indeed, working in her ſhop leſſened the proſpect of advantage from any treatment.

" July 18th, in the evening, ſhe was taken with a ſevere rigor, and I gave an opiate, and a doſe of ipecac. in aq. ammon. acet. which brought on a profuſe ſweat; ſhe had three ſuch rigors in 20 days, which appeared to be owing to the ſedative action of new-formed ſloughs, and which, at this time, exhaled ſuch a fetor that Mr. Craib could not endure it.

" There was an ointment rubbed in, into the ſide of the ribs, ſimilar to the pill, ſubſtituting ſulphur for antimony, alſo of Dr. Niſbet's preparing. The applications were of my ſuggeſting, and thoſe I conceived the leaſt ſuſpicious of irritating, and diveſted of unctuoſity, which quality is ever hurtful to ſuch ulcers.

" I was now ſorry that the plan had been purſued ſo long, as no advantage had been got by it, either in the diſeaſed appearance of the breaſt, or the ſores; the laſt were greatly enlarged, and the breaſt had leſſened in ſize in an equal proportion only to the general waſte in the body. She was now preſſed to go into the country as the only reſource, but as her journey was to be to Nottingham, ſhe wiſhed for ſtrength to bear ſuch fatigue.

" On the 16th of Auguſt, in the evening, ſhe got out of bed to have it put to rights; thinking ſhe would ſhortly return to it, ſhe did not put on her ſtays; and in this ſtate remained longer up than ſhe at firſt intended, or thought herſelf able.

" For want of her ſtays, as ſhe thought, and in my opinion rightly, a pain ſeized her under the right breaſt, which ſhe apprehended aroſe from flatulency, and drank ſome glaſſes of Madeira wine to diſpel it; however, the pain increaſed, and I was called at five in the morning, when her pulſe could be hardly felt; ſhe was obliged to ſit up, was crying out continually with pain, at the ſame time preſſing forcibly on her ſide for eaſe.

« I bled her to nine or ten ounces, and applied aq. ammon. pur. with a little oil, to excite a ſudden irritation, and ſave farther weakening by loſing of more blood, and gave a doſe of opium and ipecacuanha directly after.

« However, the pain recurring from a fit of coughing, I was obliged to repeat the bleeding about four hours after the firſt, to about the ſame quantity, both of which were highly buffed and cupped. Her pulſe roſe, and I continued the opiate relaxant medicine with nitre and a little volatile alkali, and found, in the evening, ſigns of expectoration coming on, and which medicine now was conſidered competent for the treatment of this ſupervening diſeaſed affection.

« At this time the breaſt was not an object of attention, only the ordinary dreſſing and cleanlineſs were attended to; and when it again became neceſſary to be examined into, the ulcer was changed into a common ſore, the breaſt ſhrunk, and conſiderably abſorbed; and in a ſhort time the whole was taken up as well as the ſwelling in the axilla, leaving for ſome little time after, a ſmall diſcharge from the moſt deep-ſeated ulceration, which alſo, in defiance of a ſtimulating application to keep up a diſcharge, cloſed.

« Ever ſince her breath has been ſhort, and checked with cough, and glary expectoration; the pulſe, which before, I believe, never exceeded 80, was now upwards of 130, creeping and indiſtinct. She appeared exſanguinated, and very feeble; an iſſue was made in the oppoſite arm, but with no marked advantage.

« On the 2d of October her oppreſſive breath in ſome degree increaſed, with teazing cough, for which ſhe was ordered her former mixture, with the addition of the tincture of digitalis, which moderated both; but from my enforcing the neceſſity of increaſing the expectoration, ſhe was afraid her medicine was mercurial, and did not purſue it properly.

« Her breath and cough continuing troubleſome, on the 21ſt anaſarcous ſwelling of the face, ſtuffing, and fullneſs in the bowels, came on, with a ſcarcity of urine, ſometimes high coloured, and with copious ſediment; ſometimes the urina jumentoſa, ſecreting not more than four or ſix ounces in twenty-four hours. In addition to her above mixture, ſhe took ʒiv. of the cream of tartar in an electuary, with ſome oil of aniſeed, daily.

« On the 24th the urine was a little increaſed; and afraid of her nauſeating the medicines, I compreſſed them into one doſe three times a-day, or occaſionally, as,

(No. 36.) ℞ Pulv. digital. gr. j.
Cryſtal. tart. ʒij.
Pulv. Ipecac. gr. jß.
Pulv. Zinzib. gr. ij. Miſce.

« Under this plan, the ſecretion of urine was increaſed; her pulſe,

before hardly perceptible, became ſtronger; her cough leſs troubleſome; expectoration eaſier, and more free, amounting to near a pint of glary mucus, ſome a little yellow, in twenty-four hours.

"On the ſubſidence of the continued irritation in her breaſt, and no appropriate ſuccedaneum being made, I introduced a ſeton into the ſide, ordering, over and above the powder, an infuſion of caſcarilla with parſley-ſeed, changed afterwards for quaſſia and carraway-ſeeds.

"The pulſe being now 110, the ſecretion of urine plentiful, a little redneſs of health appeared again in the lips, and the pulmonic affection being the principal object, I gave her the following pill three times a-day, alſo a doſe of cream of tartar occaſionally, with the infuſion, conſtantly, three times a-day:

(No. 37.) ℞ Pulv. digital. gr. j.
Ipecac. gr. jß.
Ext. papav. alb. gr. ß.
Ol. aniſi. g. jß.
Syrup. ſimp. q. s. fiat pilula.

"With this the breath was expanded, and a purulent expectoration enſued; notwithſtanding, much general relief was not felt till the 13th inſtant; in the night a moſt ſevere pain attacked the right temple, and over the eye, which, in the morning, terminated in an eryſipelatous ſwelling.

"On the 15th the ſwelling increaſed, and blindneſs enſued; the breath and cough were much improved, from, probably, the diſeaſed irritation being determined to the face; this induced me to preſcribe patience only; and on the 18th it totally diſappeared, but with an evident aggravation of the complaint in the cheſt.

"She now occaſionally drinks, to her meals, malt infuſion in the different ſtages of fermentation, with yeaſt, in addition to her other plan.

"In the reduced ſtate Mrs. Craib was in, when the pleuriſy took place, perhaps much of its violence might have been owing to a mercurial habit, but not a little to about a pint of Madeira wine ſhe drank from the commencement of it. The bleeding and relaxants employed, produced a quick abſorption, and the general inflammation changed the ulceration to a common ſore, which had ſuch a tendency to heal, that it cloſed up in defiance of a ſtimulating ointment applied to keep it diſcharging.

"I have confined myſelf to the ſtatement of facts; and how far art had to do with the changes that took place, I leave the profeſſional gentlemen to determine. What I have now to regret is, that none of them holds out hopes of a remedy to ſuffering humanity afflicted with ſuch a dreadful diſeaſe as cancer; and though I admit of the removal of the diſeaſed breaſt, and ſwelling in the axilla, by

an effort of the conſtitution *, it is my opinion that *neither of the caſes was cancer*, certainly not *idiopathic cancer*. All who ſaw Mrs. Oſborn's caſe, ſaid it was a true cancer; but Mr. Lewis, ſurgeon, in Half-Moon-ſtreet, who examined it at this time, was of a different opinion; he had his reaſons; and the reſult of the caſe ſatisfied me his deciſion was judicious. Mrs. Craib's was more equivocal."

It ſeems that Dr. Neſbitt's account of the latter caſe, which appeared in the ſame periodical work, and which endeavoured to repreſent the diſeaſe as *decidedly cancerous*, did not ſatisfy Mr. Oliphant, who ſtrengthens his oppoſition to the doctor's ſtatement by the following account of Mrs. Craib's ſubſequent ſituation.

"My ſtatement," ſays Mr. Oliphant, "ſo far from advancing that I had cured the patient, according to Dr. Niſbet's attack, will be found to contain theſe words: 'However, ſubſiſting ſtill is a *ſcirrhus* in the right breaſt, which ſeems to enlarge with her repletion; and there is not the leaſt doubt of morbid irritation exiſting in her habit, moſt likely the offspring of her abſorbed diſeaſed breaſts, or that diſpoſition which produces ſcirrhus.'

"I am ſorry my opinion has been realized. On the 1ſt of this month ſhe ſent for me, to ſhew me a few eruptions that had come out the preceding fortnight; and with conſiderable relief to her inſide, ſhe told me. When I ſaw her, I found there were innumerable affections of the miliary glands of the ſkin of both breaſts, particularly under the abſorbed one, extending a great way on the ſide under the arm. The laſt healed ſore, where the abſorbed one was, was re-opened; on ſeveral other parts of this ſurface conſiderable ſcirrhous tubercles have ariſen. In the right breaſt, from being left with a ſmall pendulous ſcirrhus, ſuſtained by the flaccid integuments, the ſkin has now contracted; which draws up the increaſed ſcirrhus, and the whole threatens to become one maſs of diſeaſe, of much more ſerious conſideration to Mrs. Craib than any former ſtate of her malady that I have witneſſed: her preſent weakneſs, alſo indifferent appetite, bad digeſtion, a diſpoſition to anaſarca, and her pulſe upwards of 112, have diſabled the conſtitution from ſuſtaining ſuch a grievous load for any great length of time."

Sect. II. *Cancer of the* Uterus.

In addition to what has been ſaid generally of cancer in the foregoing ſection, it is neceſſary to take ſome notice of this diſeaſe as it

* See the influence of febrile action in the Aphoriſms of Hippocrates: "Febris morbum tollit." And Gaubius, "Licet enim commotio iſto, perturbato circulationis ſyſtemate gravibuſque ſymptomatis moleſta, haud raro perniciem inferat, hinc merito morbus appelletur; ſæpe tamen et mirifice adeo ſalutaris eſt, ut certius aliud potentiuſve cum ad ſanandos, tum præcavendos morbus auxilium natura vel ars, vix agnoſcat."

affects a part of the body which gives occaſion to very diſtinguiſhing characteriſtics, and where alſo the treatment is, of neceſſity, to be conducted in a more circuitous way. Except in the *peculiar kind of pain* which diſtinguiſhes the cancer from other local affections, and, alas, we may add, the too *uniformly fatal event*, there is little in this diſeaſe in which it reſembles the cancer of other parts. It is indeed preceded by the ſchirrhous ſtate, but when advanced it exhibits appearances far from ſimilar, nay, indeed, totally oppoſite to the open cancer of the breaſt, and various reaſons have been aſſigned by late writers, but particularly by Mr. Adams in his treatiſe on Morbid Poiſons, for conſidering this diſeaſe altogether as a diſtinct one. This point, however, not being fully eſtabliſhed, we ſhall here tread in the beaten track, and endeavour to ſhew what medical men have attempted in the treatment of a diſeaſe ſcarcely however within the reach of human aſſiſtance. The progreſſive ſteps of the diſeaſe will be ſufficiently ſhewn in the following account of *certain morbid affections of the uterus*, by Dr. Lettſom, publiſhed in the Memoirs of the Medical Society of London.

Case I. "Margaret Rackall, 36 years of age, was delivered of a dead child on the 26th January, 1791, in the ſixth month of her pregnancy.

"Prior to this event, ſhe had been troubled with a cough for ſome months, and it continued in much the ſame ſtate ſince ſhe took to her bed. Early in the above month, ſhe had ſymptoms of fever, which had been augmenting till the time of my attendance, which was on the 10th inſtant, though on the 9th, I was informed, there came on a chilline's of the extremities, which was ſucceeded by fever, terminating in a ſweat; the whole formation of the paroxyſm laſted four hours, and returned in the ſame manner fourteen hours afterwards. She had alſo laboured under a diarrhœa for ſome days, and the evacuations were extremely offenſive. A nauſea likewiſe diſtreſſed her, on which account a vomit had been taken the day before. The pulſe was at this time 130. The urine for the ſpace of three days had depoſited a lateritious ſediment, and ſhe had even begun to take the Peruvian bark.

"The languor was indeed extreme; the countenance appeared contracted and melancholy; aphthæ had appeared, though in a ſmall degree.

"I ordered a drachm of bark to be taken every two hours, with three drops of thebaic tincture in each doſe, to eaſe pain and prevent a diarrhœa.

"Jan. 11. She had a ſevere rigor, and violent hot fit, and ſweated conſiderably; there was neither pain nor tumeſcence of the abdomen. After this paroxyſm the ſame medicine was ordered every hour, with only the occaſional uſe of thebaic tincture. The legs and abdomen were fomented with the common fomentation. The diarrhœa did not return; the urine depoſited a copious ſediment. In

the night she had a more violent rigor, which was succeeded by very trifling heat, but soon ceased, and she expired in cold clammy sweats."

The appearances on *dissection* are thus described. "The omentum appeared to have been drawn out of its natural position, and was closely tucked under the intestines on the left ileum: but this part, as well as the intestines and the abdominal and thoracic viscera, were in a sound state, except the os tincæ of the uterus, where a sphacelus had taken place, and extended about half an inch."

Case II. "The first appearances of indisposition of M. L —, were a sense of weight and of bearing down forwards, with a frequent desire to make water, and a dull, sometimes a shooting pain, of the vagina: constipation of the bowels gradually increased, and at length, an uneasiness in passing stools.

"My attendance was requested in the month of June, 1791, after she had laboured under these complaints full three months. About three years before she was delivered of an healthy child, and recovered without the intervention of any particular incident, till the present period: she was even now about the house as usual, but found exercise so fatiguing as to prefer keeping within doors.

"The menses appeared twice or thrice in the month in small quantities, attended with acute pain in the pelvis, and a sense of forcing forwards and downwards, as if a large body were descending: that she was costive has been remarked, and now the stools in passing excited the same pain in the pelvis. For a week or two before I visited her, she had had rigors, and sometimes a hot fit resembling an intermittent; these came on at irregular periods, two or three times in the week, and at length every day, sometimes twice a-day, or every other day; but the Peruvian bark, which she took freely, appeared to have no effect on these paroxysms.

"I imagined at the first, that there might be some morbid affection of the coats of the bladder, and ordered a combination of cicuta, opium, and calomel; but this affording no other relief, than what might result from the opium alone, it was given without any addition.

"The patient having at length consented to be examined per tactum, the result ascertained the disease to exist in the uterus; the os tincæ was found enlarged and thickened, and of a scirrhous hardness. The following plan was then adopted.

(No. 38.) ℞ Arsenici albi pulv. gr. xvj.
Salis nitri purif. gr. xxxij.
Coque in vase vitreo cum aq. distill. ℥iv. donec arsenicum penitus solutum fuerit; dein adde
Spirit. lavend. comp. ℥ij.
Aq. puræ ℥v. ut ft. mensura ℥viijs. et facta unica ebullitione filtrentur ℥viij.

(No. 39.) ℞ Hujus ſolutionis gut. xij.
Aq. menth. ſativ. ℥iſs.
Sp. Cort. Aurant. ℥iſs. ft. Hauſt. augendo ſenſim doſin ſolutionis uſque ad gutt. xvj.

« Of the draughts ſhe took one three times in the 24 hours, and continued them for the ſpace of a month. Of opium ſhe took from five to ten grains every day, and ſometimes even twelve grains. Pain and debility however increaſed; the appetite failed; frequent vomiting enſued, and accelerated the debility, and ſhe expired three months after my firſt attendance.

Case III. « Eliz. Farrow, a widow about 50 years of age, who had paſſed the time of menſtruation, was firſt indiſpoſed in the month of January, 1791; the principal complaints at this time were a tendency to nauſea, ſometimes excited to vomiting; and a difficulty in making water, accompanied with more or leſs pain.

« Theſe continued in different degrees of violence till the 24th of the following September, when I was conſulted. The patient kept a public-houſe, but had the character of being temperate; her complexion, however, was inclined to ſwarthy, which led me to ſuſpect ſhe had occaſionally uſed ſpirits, eſpecially as her appetite for food had greatly diminiſhed, and what little ſhe did take, was often ejected: there was likewiſe a fulneſs about the ſcrobiculus cordis, which ſtrengthened my ſuſpicion of bilious congeſtion. The pulſe was weak, but not irregular. The pain which ſhe originally had in making water, was ſtill diſtreſſing; ſhe explained the forcing pains as like thoſe of labour, with a ſhooting acute uneaſineſs, during and after micturition, up the vagina. She was never free from ſome ſenſation of load or preſſure about the perinæum. This irritation to make water frequently waked her in the night, and compelled her to attempt its expulſion, though little was diſcharged, but always with pain. The ſediment or mucus was that kind which occurs in cyſtorrhœa, though higher coloured than is uſual.

« As the pain ſeemed particularly to centre about the ſcite of the bladder, I ſuſpected the ſymptoms might reſult from its morbid ſtate, and the vomiting from bilious congeſtion: there were, however, other ſymptoms, that excited a doubt of the ſuppoſed ſeat of the diſeaſe. The patient had ſome irregularity in going to ſtool, and conſequent pain, that did not appear connected with the ſtate of the bladder.

« When I firſt attended, ſhe was in general coſtive, with intervals, however, of the contrary ſtate; and under an opinion of bilious congeſtion, I preſcribed laxative remedies, hoping that by ſoliciting evacuations through the rectum, the vomiting would be relieved, and the appetite and ſtrength thereby improved.

« Although plentiful evacuations were procured, the vomiting was not relieved, and the lancinating pains of the pelvis continued

to increaſe, which induced a ſuſpicion of uterine miſchief. On this account Mr. Norris was conſulted, who, from a careful examination, concluded that there was a morbid enlargement and induration of the uterus.

" The patient at this time expreſſed a ſtrong averſion from medicine, although her pain and weakneſs increaſed; and a diarrhœa frequently occurred. However, ſhe occaſionally took anodynes to mitigate her ſufferings, of which ſhe was finally relieved by death on the 26th of October, when ſhe was opened by the ſurgeon, accompanied by Mr. Lane, her apothecary, who viſited her throughout the diſeaſe.

" On opening the body the liver was found of a ſmaller ſize than uſual, of a light greyiſh colour, and of that degree of hardneſs which might be termed ſcirrhous. The duodenum, particularly that part of it which is contiguous to the ſtomach, was inflamed. The uterus was ſomewhat enlarged, and very hard through its whole ſubſtance; and, from its fundus externally, immediately under the peritonæal coat, there aroſe a tumor about the ſize of a common walnut: in this tumor, which was of the ſteatomous kind, beſides the uſual contents, there was a thin plate of bone, which had a number of ſharp ragged points, that pierced its inveſting membrane, and might account for the inflamed ſtate of the ſmall inteſtines in contact with it, for which no other obvious cauſe could be diſcovered.

" From many of the ſymptoms firſt deſcribed, ſome affection of the bladder or urethra, had been ſuſpected, but in theſe, and all other parts, except thoſe already mentioned, no diſeaſe whatever appeared.

" The caſes I have curſorily related," continues Dr. Lettſom, " came under my obſervation in the year 1791. I have ſince attended many ſimilar inſtances, with various ſucceſs, but I have not ſeen one fatal caſe ſince, aſcertained by diſſection. When any unfortunate event has ſucceeded our practical treatment, it becomes us to retrace the whole ſtate of the diſeaſe, and to conſider under ſimilar appearances, ſhould they ever again occur, whether any other mode of treatment might be rationally adopted.

" With reſpect to the firſt caſe, at the period of my attendance, I cannot conceive that any other plan merited preference: from the violence of the paroxyſm ſhe had juſt merely ſurvived, I expected that the next would certainly prove fatal. I have, in ſome caſes, aided the immediate effect of the bark, by giving it likewiſe in clyſters, with manifeſt advantage, eſpecially when it cannot be taken in ſufficient quantities by the mouth, or is ejected from the ſtomach.

" Were a caſe ſimilar to the ſecond again to preſent, I ſhould adopt a different treatment. I have ſince frequently ſeen uterine affections reſemble intermittents, and in no one inſtance has the bark afforded relief, but it has often proved injurious.

" Indeed, ſo far from adminiſtering tonics, I ſhould give relaxants and evacuants; but on the general treatment of ſimilar diſeaſes I ſhall revert in a ſubſequent page.

" In any acute affection of the uterus arſenic muſt be pernicious; and, as to its exhibition in ſcirrhous or chronic diſeaſes of this viſcus, I conclude, from the experience I have had, that it affords no benefit; and, as it is a mineral of dangerous powers, in unſkilful hands, it ought to be interdicted in the complaints I have deſcribed.

" I lament that I did not treat this patient in a mode I have ſince found ſo ſalutary; whether ſhe would have been cured or not cannot now be aſcertained, but I think, ſhe might have enjoyed a prolongation of life, and with a degree of comfort.

" The third caſe appeared by diſſection to be a good deal complicated, and, as the patient was not diſpoſed to adopt the very aid ſhe aſked for, no plan could be carried into execution, and probably, from the high ſtate of diſeaſe, no remedies could have availed.

" It is a melancholy addition to the catalogue of female miſeries, that the uterus is a part which frequently becomes the ſeat of excruciating torment. Sometimes it becomes extremely diſeaſed by a ſcirrhus, ulcer, or cancer, and yet the patient ſhall drag out a long, though painful, exiſtence. Other inſtances of apparently trifling affection of this viſcus, ſhall not only be attended with acute ſuffering, but likewiſe ſucceeded by early fatality: probably, however, were the primary ſymptoms attended to, and that ſtate of diſtreſs and pain which is connected with the firſt ſtage of morbid turgeſcence or inflammation, much of the ſubſequent miſchief would be obviated, and health reſtored; in which I am confirmed by numerous examples which have lately come under my obſervation.

" As the pelvis contains parts frequently affected, as well as the uterus, it is firſt requiſite that the diſeaſe be duly characteriſed and aſcertained. This viſcus is ſituated between the rectum and bladder, both liable to morbidity, and to pains not very diſſimilar to thoſe reſulting from the uterus.

" When the rectum is affected either with the hæmorrhoids or ſcirrhoſity, the uneaſineſs is more particularly perceptible in the neighbourhood of the rectum, or at the anus. The former diſeaſe ſhews itſelf frequently either by the diſcharge of blood, or ſome external fulneſs about the anus; at the ſame time the conſtitution of the patient is rarely impaired by it, and ſometimes experiences relief; and, ſhould any doubt remain, the diſeaſe itſelf may be aſcertained by the touch. Occaſionally there is ſome uneaſineſs or difficulty in micturition, but not often; and, when it does attend, it is trivial. The pain in going to ſtool is more exquiſite; ſo it is in the ſcirrhous rectum: but in this latter affection the needing to ſtool is more violent, and, the fæces never paſs without being contracted, ſo as to ſhew they have been diſcharged through a very narrow aperture; they are generally thin, ſpirting, and frequent,

and the conſtitution becomes more diſordered than from the hæmorrhoids; difficulty of making water is not indeed always a concomitant; and laſtly, it may be aſcertained by examination; ſo indeed may moſt diſeaſes of the uterus, but patients reluctantly ſubmit to this criterion.

"Affections of the uterus are not reſtricted to any particular age, it is uſually, however, about the commencement of the menſes; and their ceſſation, and occaſionally in any part of the intermediate time, and not unfrequently after geſtation, in conſequence of ſome change brought on in the ſyſtem of the uterine veſſels; but in ſuch caſes it is probable that a morbid diſpoſition in the uterus had previouſly exiſted, and which, perhaps, would have ſhewed itſelf in ſome period of life independently of parturition.

"The morbid affections of the uterus, whether ariſing from active inflammation, chronic enlargement, or ſcirrhoſity, are attended with a concatenation of ſymptoms ſufficient to diſtinguiſh them from affections of the rectum or bladder, though in ſome meaſure the ſymptoms of both. I know of no other viſcus that combines that peculiar ſenſe of load about the loins; that bearing down forwards and backwards; that dull pain of the upper and internal parts of the thighs; that throbbing uneaſineſs after going to ſtool, and pricking ſenſation up the vagina and urethra after making water; that diſpoſition to nauſea and vomiting of mucus, with flatulence of the lower belly, limited to no part of the day; and beſides, a diſcharge by the vagina, ſometimes green or yellow, ſometimes bloody or feetid, always different from the fluor albus, and always with pain from external preſſure on the abdomen. In women attaining puberty, of a ſcrophulous habit, affections of the uterus are apt to occur; but, in general, more frequently a little before or after the ceſſation of the menſes. In young women, ſhould the menſes not appear, or, when appearing, in ſmall quantity, with a chlorotic complexion, even were many of the complaints above mentioned to exiſt, I ſhould rather aſcribe them to an indolence of habit, which required chalybeates, deobſtruents, and other means of ſtrengthening the conſtitution. The morbid ſymptoms that indicate ſcirrhus or inflammation, are prevalent only in a very different ſtate of conſtitution; there is uſually rather a florid than a chlorotic appearance, and the bearing down and lancinating pains are not preſent in chloroſis, nor the uneaſineſs in making the excretions.

"In general, perſons ſubject to the dangerous affections I have deſcribed, are thoſe who have been liable to much pain before, and at the time of menſtruation, and to a profuſe diſcharge, rather than to a diminiſhed quantity. Theſe circumſtances have attended for many years before complaint has been made, and the ſex are apt to aſcribe ſuch pains to the natural conſtitution connected with the menſes, rather than to any morbid ſtate of it, till at length weakneſs and agony have convinced the afflicted object of the neceſſity of

medical aid; that aid, however, if not too long postponed, may, by prudent application, be productive of future relief and comfort.

"Were the uterus really in a scirrhous state, perhaps little more could be expected than palliatives; but I have seen all the symptoms described really present themselves, and removed by medical aid, before the scirrhous state was actually confirmed. I conceive, in general, there is so much pain, that the patient would be compelled to ask assistance previously to this confirmed malady, at the same time there is abundant encouragement to attempt the means of cure, and these means are so simple, as to require very little illustration.

"I consider, that in all these cases there is more or less of inflammation present, and, in general, bleeding from the arm may be occasionally premised; the repetition and the quantity will depend upon the appearance of the blood, the degree of pain, the strength of the patient, and the state of the pulse: the two latter are, however, very deceptive, as the disease, in the first place, requires much confinement to the bed or couch, which soon induces a degree of debility; and the pulse is generally weak, though frequently quick. But the evacuation I lay the most stress upon, is local or topical. I would advise from four to six leeches, to be applied either a little above the os pubis, or to the perinæum, and these should be repeated every second or third day, if the pain and other symptoms of uterine affection persevere. In an instance lately under my care, besides three small bleedings by the arm, the patient had eight times six leeches applied as above directed. This plan, with other antiphlogistic means, preserved an excellent woman to society, who, otherwise, I have sufficient reason to conclude, would not at this time have been in existence.

"If the patient should suffer extremely, the pain may be mitigated by injecting a solution of ten grains of opium into the vagina, or by a common anodyne clyster per rectum From the mode of treatment I have suggested, it will obviously occur, that the bowels should be kept laxative, by the most emollient means, such as castor oil, manna, magnesia, or rhubarb. Every stimulating cathartic should be avoided, and, in general, salts prove stimulant in this disease. Lenient clysters may occasionally be injected, which act not only as a laxative, but likewise as an internal fotus. In like manner external fomentations have considerable benefit, and particularly after the application of leeches, the bleeding from which they tend to promote

"Blisters may be applied to the lower region of the abdomen, as well as the perinæum; they are not apt to produce strangury, and tend to divert uterine inflammation.

"I did formerly expect benefit from the use of *cicuta*, but have not observed any salutary result from experiment.

"Mercury should not be given during the inflammatory state of the uterus, and I have no experience of its good effects afterwards.

" If it were to be tried, I ſhould prefer the mercurial ointment rubbed upon the perinæum; nor do I know whether or not iſſues to the thighs would prove uſeful.

" After the patient is relieved, periodical bleedings in the arm, and more eſpecially local ones by leeches, as before recommended, ſhould be continued for ſome months, to take off the determination of blood to the uterus.

" Mild, ſoft, cool diet, and ſippings not of a heating tendency, ſhould be long perſevered in. A decoction of ſarſaparilla, with cow's or aſs's milk, has been drank with long perſeverance, and apparently with advantage."

In a paper already alluded to, by Mr. Fearon, there is included a caſe of a cancerous affection of the uterus which was unſuſpected. The lady's diſeaſe, indeed, which proved fatal, was ſuppoſed to be a ſtone in the bladder. Mr. Fearon, however, with the attending phyſician, examined her; but no ſtone was felt; and the ſymptoms continued and increaſed in violence. To her other complaints too were added, during the laſt four months of the patient's life, the uſual ſymptoms attending on hectic patients.

" I obtained leave," ſays Mr. Fearon, " to open the body; and on examination found the viſcera of the abdomen and thorax perfectly free from the leaſt appearance of diſeaſe. But on viewing the peritoneum, extending over the uterus and bladder, I diſcovered marks of inflammation; and on further examination, found all the contents of the pelvis conſiderably inflamed. Having laid open the urethra and bladder, I found the inflammation general and uniform throughout both, without the leaſt appearance of a ſtone.

" On opening the *uterus*, I found a ſcirrhus of the cervix uteri; which unravelled the cauſe of our patient's death, and which had produced the inflammatory appearance throughout the contents of the pelvis."

The author thought proper to record this caſe, as a very important one; " becauſe it proves, that, at a very early period indeed, this diſeaſe may prove fatal; we ſhould therefore be ſo far on our guard, to expect the exiſtence of this diſeaſe at any period of life, when the ſymptoms lead us to form ſuch opinion; which, had we done in this caſe, we might probably have ſaved our patient, by adopting the plan I have juſt ventured to recommend. Another circumſtance in this caſe, highly deſerving attention, is, that a diſeaſe of the uterus may produce ſymptoms very ſimilar to thoſe of a ſtone in the bladder."

Contending for the advantage of ſmall and repeated bleedings in this and other ſpecies of early cancerous affection, Mr. Fearon adds the following remarks in concluſion.

" To thoſe very important facts of bleeding being a ſpecific," ſays he, " in the *early ſtages of ſcirrhous complaints*, I muſt alſo add, that, even in apparently reduced and ſhattered conſtitutions, when

the diſeaſe has been of long continuance, attended with affections of the lungs, ſcirrhus of the kidneys, liver, or any of the viſcera; and laſtly, with colicy pains in the bowels, a cadaverous countenance, becoming yellow, wan, and ſallow, the diſeaſe being entirely beyond operation, cicuta and opium failing in their effects, *ſmall bleedings* have the moſt happy, the moſt immediate, and the moſt deſirable good effects in mitigating the ſufferings of the patient; whoſe approaching fate we are unable to prevent."

In order to ſhew the extent to which the uterus is capable of being morbidly affected, we ſhall here preſent the reader with the following curious caſe inſerted in the Medical and Phyſical Journal, by Dr. Mackie of Lewiſham.

"On the 28th of January laſt," ſays the doctor, "I was called on to open the body of Mrs. Ruff, who died the day before, in the 72d year of her age.

"She had ſuffered much from diſeaſe, and deſired that ſhe might be opened after her death. What I could learn of her hiſtory was as follows: She was born of healthy parents, and was herſelf ſtrong and healthy till her marriage in her 32d year. She ſoon after was ſuppoſed to become pregnant; but ſymptoms of dropſy alſo appearing, ſhe was attended by Drs. Fothergill and Watſon, and an accoucheur, who all agreed that it was a caſe of pregnancy (though her menſes continued regularly), accompanied by anaſarca; and they preſcribed ſome diuretic medicines. Theſe produced a copious diſcharge of urine; the dropſical appearances ſubſided, but the ſize of the abdomen continued to increaſe, with more than uſual uneaſineſs, till the ſuppoſed time of her delivery.

"This anxious period at length paſſed over, and to the great alarm of the patient and her family, no labour or delivery took place. From this time ſhe had bad and irregular health; her bulk continued undiminiſhed; ſhe had obſtinate conſtipations; ſhe was frequently attacked with hot, burning, excruciating pains in her belly, that could only be relieved by opium; ſhe became ſubject to violent gouty paroxyſms, which confined her to her bed two or three months in the year, and left her extremities much diſtorted; and for a long while paſt, ſhe had been a conſtant ſufferer from the ſize and increaſed weight of the abdomen; and, particularly, on turning in bed, when the bulk fell to the lower ſide, in a lump (as ſhe expreſſed it), it never failed to give her the moſt diſtreſſing pain and uneaſineſs. A paralytic ſtroke, which deprived her of the uſe of ſpeech, and of one ſide, preceded her death a few days.

"On uncovering the abdomen, it appeared unuſually large, hard, and incompreſſible; the bulk rather exceeding that of a pregnant woman at her full time, and inclining to the left ſide. In cutting along the linea alba, after dividing the ſkin, I found the muſcles ſo much oſſified, from about three inches above the umbilicus, that I could not ſeparate them without a very ſtrong knife. The oſſifica-

tion extended as much below the navel, and about three or four inches on each ſide, having ſome reſemblance to the top of a child's ſkull. The inſide had a ſmooth, ſhining poliſh, apparently from its friction on the uterus, between which and theſe oſſified muſcles nothing intervened; the peritonæum being entirely obliterated. On laying aſide the ſeparated integuments, the uterus appeared in full view, filling almoſt the whole cavity of the abdomen, and even preſſing againſt the diaphragm. Its appearance ſomewhat reſembled a very large pellucid bladder diſtended with hogs' lard, and preſſed a little flat at the fundus. It was ſome time before I obſerved the inteſtines, which were puſhed into a ſpace not exceeding a cube of two inches, in the lower part of the left ſide of the pelvis, and ſeemed crowded, ſhrunk, and empty. The omentum was obliterated. Near them lay above twenty hydatids of different ſizes, of a beautiful poliſhed white colour, and ſeveral of them as large as pullets' eggs, but without any fluid.

"On attempting to cut into the uterus, the knife made no impreſſion, till great force was uſed, the oſſification was ſo complete: the divided ſides appeared of a chalky, brittle, dead white; no veſtige of nerves or blood veſſels remaining. The fundus was about a quarter of an inch thick, and perfect bone; the body of the uterus thicker, and not unlike the thickeſt parts of the occiput. The oſſification ended at the cervix, which was of a hardiſh ſebaceous texture, and four or five inches thick. On cutting through this part, about a quart of ſtrong fetid pus was diſcharged; and on making a complete diviſion of the uterus (which was large enough to contain the body of a full-grown fœtus), I found a large detached unformed ſpongy maſs, compoſed of ſoft and hard parts: the former reſembling moiſt decayed wood, and eaſily compreſſible into a ſmall bulk; the latter ſomewhat like the ends of the long bones, but no ſpecific part aſcertainable; though the whole conveyed to my mind the poſſibility of its once having been a fœtus.

"The uterus with this ſubſtance, when taken out of the body, weighed eighteen pounds three quarters, avoirdupois.

"The ovaria, Fallopian tubes, and ligamenta rotunda, differed little from their natural ſize and colour; the liver was ſmall, hard, and of a dark red, and puſhed backwards; the gall-bladder appeared as if ſqueezed by the uterus, part of which was ſtained with bile. The kidneys were larger than uſual, and covered with watery bliſters; the veſica urinaria ſmall and empty; the ſtomach, ſpleen, and pancreas, appeared ſhrunk, and with the diaphragm puſhed upwards."

To thoſe who would inveſtigate the nature of the diſeaſe immediately under conſideration, it may not be unprofitable to take the foregoing circumſtances into their view; but as theſe ſpeculations are not the object of our undertaking, we ſhall proceed to ſpeak of cancers of the womb, as belonging to the claſs of ulcerated cancers,

which is the view of them usually taken by writers on the subject. Mr. Justamond, whose practice in this disease has been already noticed, as far as relates to the treatment of cancer in other parts, says:

"I have been consulted only in four cases of cancer of the uterus, but all of them were in the *most advanced state*. In two of these I did no good, or very little; in the other two I gave much relief, and in one of them prolonged life with tolerable comfort, for a considerable time.

CASE I. "This was the first case of the kind I was consulted in, and as I have got Doctor Hunter's description of the case by me, written by himself after his examination of the patient at my request, before she put herself under my care, I cannot do better than to give it in his own words.

"'Nov. 14, 1773. This day, upon examining Mrs. ———, I find little or no discharge, or offensive smell; so far she is better than when I examined her last, about three or four months ago, during which time she has done nothing but drink the decoct. sarsaparillæ. Her principal complaint at present is an almost perpetual call to make water, with an uneasy urging pressure downwards. She has passed some small gravel; and her urine deposits large quantities of very tough slime. No hardness or tumor is to be felt outwardly in the hypogastric region; but on introducing the finger into the vagina, I still find what I should suppose to be an incurable induration of all the parts at the upper end of the vagina, and which I should suppose to be in a schirrous state that is introductory to ulceration and cancer. The hardness with inequality of surface begins about half an inch within the extremity of the urethra, and about half an inch more inwards still, the vagina is contracted into a hard round ring, little larger than just to allow the last joint of my finger (which is small) to pass. The point of the finger meets there with a softer round piece of flesh, probably a fungus; and the ring, with all the parts surrounding it, are so firmly fixed, that a pretty firm pressure gives them no motion, nor does it give her pain. This hard ring would naturally pass for the os uteri, but I think it is too near the external parts to be any thing but vagina.'

"Such was the state of the case as given me by Doctor Hunter, to which I shall only add, that this perpetual call to make water was the misery of her life; so that she scarce ever dared to go abroad, could not suffer the jolting of a coach, and was frequently scarce able to remain for one quarter of an hour in the same posture. When she addressed herself to me to know whether I thought my medicines would be of any service to her, I freely declared that it was a question I could give no satisfactory answer to, not having experienced them in any case of the kind. Besides, they were cases that, not admitting of any surgical operation, nor indeed of any immediate topical application, except from injections, did not so commonly fall under the cognizance of the surgeon, and I could

not, therefore, take upon me to promiſe her any relief: nevertheleſs, if the knowledge ſhe had of what I had done in other cancerous complaints made her wiſh to try the effect of my remedies, I could take upon me to aſſure her that they would at leaſt do her no hurt, if they did her no good. She reſolved then to put herſelf under my care, and the method I purſued was to preſcribe the pills made with *flores martiales*, to order the *hemlock bath*, and to have an *injection* thrown up, compoſed of a ſtrong *decoction of hemlock* and my liquid * in equal parts; adding to or diminiſhing the quantity of the liquid as I found ſhe could bear it. She ſoon took twelve, fourteen, and ſometimes twenty pills in the courſe of the day, each containing ten grains. She went into the hemlock bath, and ſtaid in it from half an hour to an hour, and ſhe uſed the injection three or four times in the day. She ſoon grew better in health and freer from anxiety and uneaſineſs, and when ſhe had perſevered in this method for three months, ſhe found herſelf ſo much recovered, that ſhe could ſit quietly in company, and play at cards as other people, undiſturbed by thoſe frequent calls to make water, which had before been ſo troubleſome to her. She could alſo bear to go out in her coach, and in a word, was ſo materially relieved, that ſhe conſidered herſelf as almoſt cured. Though I was far from entertaining ſuch ſanguine hopes, yet it is certain that the progreſs of the diſeaſe was ſo far checked, and the uneaſineſs of her ſituation ſo thoroughly removed, that ſhe lived upwards of a year and a half after her firſt applying to me, ſeveral months of which period ſhe paſſed in great comfort and eaſe. She continued the bathing and pills during all the ſummer of the year 1773, and remained tolerably well till the beginning of the year 1775. Her complaints began then to return, and continued in a greater or leſs degree till the time of her death; but they never roſe to ſuch a pitch as they were arrived at when ſhe firſt applied to me; for in the few weeks before her death ſhe ſuffered more from a continual hectic fever than from her local complaints, though it muſt be owned theſe were likewiſe much exaſperated, particularly the pain ſhe uſed to complain of in her back.

"It is neceſſary alſo to mention, that upon the firſt return of her complaints, I deſired that Dr. Hunter might examine her again, to aſcertain the ſtate of the parts. This he was ſo kind as to do, and to give me again the account in writing. But this laſt paper is among the many I have loſt, ſo that I cannot even aſcertain the time

* We have before deſcribed the remedy here alluded to as ſimilar to the *tinctura ferri muriati*; but its ſtrength muſt, doubtleſs, be *much inferior*, otherwiſe, we apprehend, the ſtimulating effect of *an injection in theſe proportions* muſt be too great. The preſcription for making the liquid ſo frequently mentioned, is to be found in a pamphlet published in Latin, at Vienna, in 1767, by Francis Xaverius de Mare, who ſtyles himſelf doctor of philoſophy and phyſic. The title of the book is, "Tractatus Medico-chirurgico-chemicus, de cancro et ſpina ventoſa curabilibus per medicamentum hactenus ſecretum, nunc communicatum."

when this examination was made. To the beſt of my remembrance, it was in the ſpring of the year 1776; and it is but juſt and candid to declare that the tenor of this laſt paper, as I have it from my memory, ſignified that the doctor found little or no alteration either for the better or the worſe in the ſtate of the parts ſince his laſt examination: ſo that, however the ſymptoms might have been relieved, the diſeaſe ſeems to have exiſted invariably the ſame.

Case II. "Another caſe of a cancer in the womb, to which I was called, was that of a mantua-maker in Piccadilly. She appeared to me ſo near death when I firſt ſaw her, which was in the month of February, 1774, that I attempted to diſſuade her from doing any thing. But ſhe had been ſo ſtrongly perſuaded of the relief I had afforded in the caſe above mentioned, and withal ſo totally overcome with pain, that ſhe conjured me to try what could be done. Her pain was conſtant, ſo that ſhe ſcarce got any reſt, even with large doſes of opium. The diſcharge from the uterus was prodigious, conſtantly wetting through numbers of thick cloths that were laid under, and frequently changed, to receive it, and was ſo intolerably offenſive that one could ſcarce bear the room. Add to this, that the patient's ſtrength was totally exhauſted, and her complexion changed into a yellow cadaverous hue. I directed her to go into the hemlock bath every other day, and to take the pills with flores martiales conſtantly and freely. Deplorable as this caſe ſeemed to be, I was aſtoniſhed at the ſudden change produced in it. In three weeks' time, the patient's pains were ſo far leſſened, that ſhe ſlept comfortably with much leſs opium than ſhe had uſed before in vain; and her ſtrength was ſo far recovered, that ſhe could ſit up beſt part of the day. The diſcharge was ſo amazingly reduced in quantity, that it was not in the leaſt troubleſome to her, and the ſmell of it was inoffenſive. Notwithſtanding theſe favourable appearances, ſhe died, after remaining for about four months in a languiſhing but quiet and calm ſtate, free from the violence of thoſe ſymptoms that had excruciated her for ſo long a time before ſhe had applied to me, and which nothing ſhe had hitherto tried could give the leaſt relief to. Although this caſe was ſo deſperate, that it could not certainly have been conſidered as any impeachment of the method if no effect had been produced by it, yet I cannot but be perſuaded, that, beſides the ſpeedy and unexpected alleviation of all the ſymptoms, it contributed to allay the miſeries of this patient during the laſt months of her exiſtence.

Case III. "The third patient who put herſelf under my care with this dreadful complaint, was a lady of quality. The lady flattered herſelf that ſhe felt ſome degree of relief at firſt; but for my own part, I freely acknowledge that I do not think ſhe received the leaſt benefit. It is neceſſary, however, to obſerve, that her ſtomach being very weak, ſhe never took the martial flowers ſo freely as the other two patients.

CASE IV. "The wife of a surgeon in the country, was the subject of the fourth case of cancer of the uterus that fell under my notice. Though the patient was a young woman, yet her case was as far advanced as that in the second instance, but in a different way. Being less corpulent, the discharge was less, and less offensive; but the frequent and considerable losses of blood she sustained, had reduced her to extreme emaciation and weakness. The relief procured in this instance was more marked than in the last, but not in the least to be compared to what I had seen in the two first instances. My patient returned into the country, and died a little more than two months after she had applied to me."

It has often been observed, that our frequent failures in the cure of a cancer in the breast, arise principally from the long concealment of this complaint, proceeding from the ill-judged and fatal modesty of some women. The disease in some, thus becomes unfit for the operation, or too much fixed in the habit to be relieved by it. This bashfulness must operate much more strongly with women who are afflicted with a cancer of the womb; and how much more effectually must it prevent the success of any means that may be attempted to cure this too common and too fatal disorder of the fair sex. Neither indeed, could women prevail upon themselves to disclose these complaints in their earliest stages, which we are inclined to think they often do under the appearance of other disorders, is there any determined criterion to assure the physician or surgeon of the nature of the disease. The most terrible cancers of the breast sometimes proceed from almost imperceptible beginnings, or from small schirrous tumors, which shall have existed for many years in the body, without pain or trouble to the patient. And it is reasonable to presume, that these uterine complaints may arise from the same imperceptible beginnings, and may also continue in the part for a long time before they exert their violence. Many women have complained of pain in the back, which, though not violent at first, and coming on only at intervals, has been considered by themselves, and by the medical people they consulted, as rheumatism or gravel, and has been treated accordingly, or neglected as a thing not very violent, and that would of itself wear off. This is sometimes attended with a fluor albus, or what is commonly called the whites, in which case the pain in the back is often attributed to debility arising from the discharge. These symptoms, it is to be feared, even when separate, indicate frequently the *beginning of the cancer in the uterus*, and when combined, more particularly so. It is necessary therefore when a female patient complains of pain in the back, to examine carefully the nature and seat of the pain. If it be rheumatic, it will generally be seated about the fascia of the loins, it will be exasperated by lying in bed, and more severely felt upon first rising

from a recumbent poſture, and it will be alleviated by the neceſſary motion and exerciſe of the day. If the pain proceed from urinary complaints, it will probably be ſeated higher up in the loins, and will moſt properly be diſtinguiſhed by the other concomitant ſymptoms of theſe affections, and by their yielding to the uſual remedies preſcribed in ſuch caſes. But if the pain be of that pricking darting kind ſo peculiar to the cancerous affection, if it be much aggravated by motion, and if it be ſeated lower down than the fore-mentioned complaints, upon the os ſacrum, and particularly if it be attended with a diſcharge from the uterus, though ever ſo inoffenſive, we may have reaſon to ſuſpect an incipient, or, perhaps, a more advanced ſtate of a ſchirrus of the womb. If patients were examined in this early ſtate, by a ſkilful anatomiſt and an experienced man-midwife, well verſed in the natural feel of the parts, the true nature of the diſeaſe might perhaps be aſcertained.

Mr. Juſtamond concludes his remarks on the treatment of this diſeaſe in the following words: "I have been more particular," ſays he, "in endeavouring to trace the beginnings of theſe uterine affections, from an expectation that if they could be diſcovered in their early ſtate, they would be much more likely to yield to the uſe of the hemlock bath, and the free adminiſtration of the flores martiales, joined with aſtringent injections, than other cancerous diſeaſes. Theſe expectations have been raiſed in me, not only by the experience of their effect in the preceding caſes, but alſo by the accidental diſcovery of the great effect of the flores martiales in the liberal doſes I have uſed them, in curing the fluor albus; a circumſtance which I hinted at in the former part of this work. I am not ignorant that this medicine has been preſcribed by many perſons in this common but troubleſome diſtemper; but it has been uſed in *ſuch ſparing doſes*, that its great and peculiar efficacy has not been aſcertained. A phyſician of great learning and eminence, to whom I had frequently communicated my thoughts on this ſubject, aſſured me that he had not met with any diſeaſe more rebellious than this. He alſo informed me that he had found the flores martiales the moſt effectual remedy againſt it; but having never given it in ſuch liberal doſes as are mentioned in this performance, this may have been the reaſon of his not having ſucceeded ſo fully as he might probably have done. My experience of it, indeed, is only accidental, and therefore not extenſive, becauſe theſe caſes fall uſually under the notice of the phyſician, and belong properly to his province. Some few of my cancerous patients have informed me of their being completely cured of the whites while they were taking the martial flowers for their other complaints. One of them, I afterwards was informed, had had this diſcharge to a moſt violent degree, and had previouſly taken a number of medicines for it without the leaſt effect. This circumſtance induced me to try it in ſome caſes of obſtinate gleets in

men, in which I have moſt frequently found it effectual, though not univerſally ſo. This may perhaps be accounted for, from the difficulty of prevailing upon men, who are always running about, to confine themſelves to a ſteady perſeverence in ſwallowing a great number of pills every day."

In what we have offered in this ſection, little more, perhaps, has been attempted than to exhibit difficulties and failures. Facts, however, have their value; and it is for the ingenious and enterpriſing practitioner to ſerve the cauſe of phyſic and humanity by a judicious application of them.

Profeſſor Hufeland deſcribes an extraordinary diſeaſe on the lip of a ſcrophulous boy, eleven years of age, who, when two years old, bit his under lip in a fall, ſo that a ſmall nodule appeared at firſt, which in proceſs of time degenerated into what the Profeſſor deemed a *confirmed cancer*. With this child all the quacks and old women of the neighbourhood had tried their ſchemes, when he was ſubmitted to a plan of medical treatment, which itſelf, we think, proves the reporter has inadvertantly given too ſtrong an appellation to the diſeaſe. Every *fact*, however, deſerves notice, and the intentions of Profeſſor Hufeland are not to be ſuſpected. After having preſcribed the belladonna, rhubarb, camphor, cicuta, antimony, and mercurial preparations, with little or no effect, the Profeſſor at length directed him to take fifteen drops of the volatile ſpirit of ſal ammoniac, much diluted with water, three times a-day, and to increaſe the doſes with four additional drops every day. At the ſame time, he ordered him to drink a decoction of the young ſprigs of the pine-tree (*turion. pini.*—an excellent antiſcorbutic and antiſcrophulous medicine), together with a teacupful of the freſhly expreſſed juice of carrots, every morning, and to make uſe of a luke-warm ſaponated bath, every other day. Beſides theſe, a ſolution of one ſcruple of antim. tartar. in four ounces of water, was preſcribed, of which the patient, frequently through the day, took a little at a time in his mouth, and moiſtened with it the affected part of the lip. "This ſolution," ſays Mr. Hufeland, "externally uſed, is an active reſolvent and ſtimulant remedy, from the immediate abſorption of which, by the lymphatic veſſels, I promiſed myſelf great benefit."

Scarcely had theſe remedies been regularly continued for four weeks, when an obviouſly favourable change took place in the diſorder; the ſcirrhoſity became ſofter and ſmaller; the ſcabs began gradually to diminiſh, and the diſeaſed parts became more even and ſmooth. The doſe of the ammoniacal drops was increaſed to forty, taken three times a-day, without the leaſt inconvenience; and after having duly perſiſted in the uſe of the remedies for three months, the cancerous lip was reduced to its natural ſtate, and all other calloſities about the glands of the neck, had completely diſappeared.

CHAP. V. Of BURNS.

Sect. I. *Of* Burns *in general, and their Treatment.*

Burns are attended with a degree of inflammation, greater or leſs, according to the violence of the injury; and, according to the different appearances they put on, they may be divided into four different claſſes, 1. When the burnt part is affected only with a ſenſe of heat and inflammation; 2. When it is alſo accompanied with intenſe pain and veſication; 3. When the integuments are converted into an eſchar; and, 4. When all the ſoft parts are ſcorched to the very bone. Theſe appearances are not to be produced by the ſame ſubſtance. Boiling water, for inſtance, though it will produce very intenſe pain, and deſtroy the ſkin, ſeldom produces any eſchar. Boiling oil, pitch, roſin, or wax, may produce a ſlight eſchar, and always will bliſter the part. Linen, cotton, or other coverings of the body, when ſet on fire, will act with ſtill greater intenſity; but the moſt dreadful burns are thoſe produced by melted or ignited metals, which, it is evident, may deſtroy not only the ſoft parts, but the bones alſo. A burn by any liquid ſubſtance is more ſevere when it happens *through* the medium of the clothes, than when it falls directly upon the naked ſkin, becauſe thus the heat is applied for a conſiderable time without any diminution, or at leaſt with very little, and therefore affects the parts to ſuch a degree, that the ſkin almoſt conſtantly peels off with the clothes. Of this we have innumerable inſtances, when the legs are ſcalded through the ſtockings with boiling water; and burns of this kind are conſtantly attended with very violent pain, inflammation, &c. In the mildeſt kind of burns with melted metals, or hot iron, the cuticle is ſcorched, and becomes white, yellow, or brown, according to the degree of injury. Sometimes the ſkin is entirely converted into a hard eſchar, and then ſeparates, as in any other caſe of mortification, leaving an ulcer more or leſs deep or wide, in proportion to the extent of the burn; but it is obſerveable, that the pain attending injuries of this kind is much leſs when the ſkin is totally deſtroyed, than when it is not. The reaſon is, that thus the ſentient extremities of the cutaneous nerves are ſcorched, and rendered inſenſible, and thus the pain of the burn muſt be very much diminiſhed; while in thoſe caſes where veſications only are produced, the nerves remain moſt exquiſitely ſenſible, and the moſt violent pain is felt by the patient.

In all accidents of this kind the patient's danger is exactly in proportion to the extent of the injury. Thus, for inſtance, where a perſon has unfortunately fallen into a large veſſel of boiling water, wort, &c. none of the remedies which are found efficacious in caſes o leſſer burns, will here be of any uſe. The reaſon is,

that in ſuch violent injuries the greateſt part of the cuticle is deſtroyed, and the exceſſive pain, irritation, and inflammation, excite ſuch a violent degree of fever, that the patient generally expires in a ſhort time. In ſome of thoſe caſes where the cuticle was almoſt entirely deſtroyed, the patient has expired in thirty-ſix or forty hours, in a ſtate of ſtupor. In very extenſive burns, by hot metals, or by inflamed combuſtibles, a moſt alarming degree of mortification takes place, ſo that ſometimes the patient is deſtroyed by it almoſt inſtantly; at others, he is waſted by the exceſſive diſcharge from the ulcer, and the effects of the air upon the ſurface of ſuch a large ſore; or, ſometimes, convulſions occur which prove fatal.

By ſome chirurgical writers on the ſubject of burns, we have been told that the diſeaſe will be relieved by two very oppoſite means, viz. plunging the part into cold water, or elſe into very hot water; but how it can be remedied by the latter, which, perhaps, produced it, muſt appear a difficulty with thoſe who have not ſufficiently conſidered the ſubject. When a finger or other part of the body is ſlightly burned, it will be relieved, by holding it as near the fire as we can; and, on repeating this two or three times over, the pain, though very much increaſed on the firſt application, will gradually ſubſide, and at laſt go off entirely. It is, therefore, on the ſame principle, we apprehend, that *hot* water (but by no means *boiling*, as ſome have ridiculouſly ſuppoſed) may poſſibly prove of ſervice in ſlight caſes, if the patient happen to have fortitude enough to make the experiment. The tone of the veſſels is, in fact, reſtored by a degree of heat approaching, though ſtill conſiderably inferior to, that which produced the injury; but, were we to expoſe it to the *very ſame degree*, it is impoſſible but we muſt be made worſe by it. In like manner, if we happen to be burnt with boiling water, the tone of the parts will be reſtored, by putting it, for a ſhort time, twice or thrice into a veſſel of water fifty or ſixty degrees colder than that which occaſioned the injury, keeping the part ſome time immerſed in it, by which the pain will ſoon be rendered very ſupportable, and at laſt go off altogether; and, though bliſters may have taken place, no degree of ſecondary inflammation worth notice will occur.

Rum, brandy, or other ardent ſpirits, have been much recommended in burns; and the great degree of cold produced by their evaporation from the part certainly is in favour of their uſe; but, in order that the pain may be completely removed, it is neceſſary that their application ſhould be continued for ſome time. The ſaturnine and other ſedative lotions have been recommended, as in the cure of other inflammations; but the moſt effectual remedy ever uſed in caſes of burns, either where the ſkin is quite ſound, or where it is bliſtered, but the veſications not broken, is that of vinegar. Two or three folds of linen cloth dipped in it muſt be applied all over the burnt or ſcalded place; but if, by accident, any of the

cuticle happens to be rubbed off, that part may be protected by a piece of linen cloth, exactly of the size of the sore, moistened in sallad oil, covering the whole afterwards with the cloths dipped in vinegar, and these are to be moistened repeatedly without being removed, till both the pain and inflammation cease.

Mr. Cleghorn, a brewer in Edinburgh, found this practice extremely useful, and was the first who recommended the application of vinegar to burns and scalds. After a time, if suppuration took place in any part, his custom was to sprinkle powdered chalk upon it to absorb the discharge, and cover the whole with a common poultice. We shall notice this in another place.

It is not a settled point among surgeons, whether the blisters which arise on burns ought to be opened, or not; but, if the former practice is preferred, the whole becomes like a blister made with Spanish flies, and when the cuticle happens to be rubbed off, which undoubtedly it must be, a very severe inflammation takes place, owing to the admission of the air to a sensible surface deprived of its natural covering; and, in such cases, it is by no means uncommon for the subsequent inflammation to spread beyond the limits of the original injury. Hence it is a common saying, that a burn spreads for nine days before it discovers the least inclination to heal; nay, some have been upwards of six weeks in healing, when they might easily have been cured in as many days, only by letting the vesications alone till the inflammation had subsided.

In very extensive burns, whilst these external applications are used, the patient ought to have a large dose of laudanum, by which the sense of pain will be abated, until the applications have had time to act. This ought to be repeated every six or eight hours, as occasion may require, and the cooling applications continued, until the inflammation be entirely gone, which in three or four days may be the case. But if, notwithstanding the above treatment, there is danger of a very severe inflammation taking place, blood-letting with the lancet is to be freely used, and cooling purgatives exhibited, as in other cases of inflammation. Where the cuticle is rubbed off, the following external applications may be resorted to:

(No. 40.) ℞ Ceræ flavæ unc. iij.
Olei olivæ unc. viij.

These, after being slowly melted together, should be briskly stirred till quite cold.

But the following, in some cases, is preferable:

(No. 41.) ℞ Ceræ albæ unc. ij.
Olei olivæ lib. ss.
Aceti distillati unc. ij.

After melting the two former ingredients together, the last is to be gradually incorporated by stirring.

In thoſe formidable burns produced by metallic bodies, where the ſkin, and perhaps the cellular membrane, are converted into an eſchar, we muſt have recourſe to vinegar as already deſcribed, or, as ſome ſurgeons adviſe, to a liniment compoſed of equal parts of cold-drawn linſeed oil and lime-water, which, by ſhaking, incorporate into a thick white ſubſtance, and generally give immediate eaſe. The beſt mode of applying this liniment is by means of a feather dipped in it, with which the ſurface of the burn is to be wholly rubbed over; after which, the ſore muſt be covered with a piece of fine linen folded and dipped in the ſame, the application with the feather being renewed as often as the cloth appears to be dry. In caſes of this kind, however, where large eſchars are apt to ſlough off, and extenſive and deep ulcers to be formed in conſequence, we muſt prevent, as much as poſſible, the ſpreading of the ſuppuration farther than is abſolutely neceſſary to throw off the parts that are totally deſtroyed. After theſe parts are thrown off, it will be proper to dreſs the ſore in the ſame manner as in a ſcald of a ſimple kind.

Whenever fungous fleſh ariſes in the ulcers which ſucceed burns, it may be removed, Mr. Latta aſſerts, by applying the following ointment:

(No. 42.) ℞ Alum. uſt. pulver. ſubtil. ʒiſs.
Axung. porcin. præp. ʒiij. Miſce.

Preſſure, however, by means of a compreſs and bandage, and dreſſing the wound with lint dipped in lime-water, decoction of bark, a ſolution of alum, or any aſtringent liquid, will do quite as well, or the part may be ſprinkled daily with the *pulvis lapidis calaminaris cum myrrha* of the Pharmacopœia Chirurgica:

(No. 43.) ℞ Lap. calamin. præp.
Myrrhæ pulv. ſing. unc. ſs.
Miſce fiat pulvis.

When burns are occaſioned by the *exploſion of gunpowder*, ſome of the grains of the powder are apt to be forced into the ſkin. At firſt they produce much irritation; and if they are not removed, they commonly leave marks which remain during life. Authors adviſe that they ſhould, therefore, be picked out as ſoon as poſſible after the accident; and to prevent inflammation, as well as to diſſolve any powder which may remain, the parts affected ſhould be covered for a day or two with emollient poultices. In other reſpects, injuries of this ſort are to be treated like any other kind of burns. When burnt parts are contiguous to each other, they are apt to adhere. To prevent this, pledgets, covered with any proper dreſſing, ought to be inſerted between them during the courſe of the cure.

Thus far we have detailed, briefly, the *common practice of the day* reſpecting *burns*; but conſiderable light has, of late, been thrown upon the ſubject, by Sir James Earle, and by Mr. Kentiſh, a ſur-

geon of Newcaſtle. As the principles and plan of treatment ſeverally adopted by thoſe gentlemen, are not merely *eſſentially different*, but, we may ſay, *diametrically oppoſite*, we think it neceſſary notwithſtanding the repetition of what may have been ſaid above, to conſider each under diſtinct heads.

Sect. II. *Of the Treatment of* Burns *by the* Application *of* Cold.

This particular mode of treatment is detailed in an eſſay on the means of leſſening the effects of fire on the human body, publiſhed by Sir James Earle, in the year 1799. It had however been previouſly promulgated by the author of the *Pharmacopœia Chirurgica*, in the early editions of that work. The means recommended by Sir James Earle, conſiſt in the ſpeedy application of *cold water*, or *water cooled by ice*, which is to be renewed as often as it becomes warm. The cuticle of the burnt or ſcalded part is not to be removed; all ſtimulant and oily applications are to be avoided. By theſe means, he ſays, the cure will be accompliſhed without leaving ſcars or lameneſs of the part.

"Since I diſcovered the advantage ariſing from ice," ſays the author, "I have had many opportunities of uſing it on large and extenſive burns, which have ſerved to confirm me in my opinion of its beneficial effects, whenever it has been timely and properly applied. In ſeveral caſes it has happened that, either from motives of delicacy on the part of the patient, or from the attention of every one concerned being occupied with the moſt apparent injuries, parts which were burnt have not been diſcovered in time to receive benefit from the cold application, in conſequence of which the cuticle in thoſe parts has ſeparated, ſloughs have formed and have been caſt off, leaving ſores difficult to be healed; while the parts in their neighbourhood, more ſeverely burnt, but covered with ice, have eſcaped without a blemiſh.

"I could detail many inſtances of miſchief prevented, and cures effected by theſe means; but as the progreſs of them was in general ſimilar to the two caſes already mentioned, it does not appear to be neceſſary to add to their teſtimony.

"I ſhall, however, take notice of one which occurred lately. A gentleman was much ſcalded by the overturning of a tea urn; I ſaw him ſoon after the accident, and ſent to the neareſt confectioner for ice, with which the burnt parts were bathed; the heat and pain were ſoon leſſened, and afterwards he felt very little inconvenience.

"Whether modern philoſophers will allow that fire applied to any part of the human body does remain united to it for a time, I am not certain; but ſuch appears to me to be the fact; and this opinion has, I find, been maintained by ſeveral very reſpectable authors.

"It follows, then, according to the foregoing obſervations, that the ſooner the ice is applied after the accident has happened, the better, as the fire will have leſs time to do miſchief. If the application be deferred till bliſters are formed, and ſloughs produced, a great degree of eaſe may be obtained; but the deſtruction of the parts which has already taken place, cannot entirely be prevented from going through its uſual courſe of ſloughs and ſuppuration."

Before Sir James Earle's work on this ſubject appeared, Mr. Kentiſh had publiſhed an account of an improved method of treating burns by the application of oil of turpentine to them in the firſt inſtance. This will form the ſubject of the next ſection, but no notice having been taken of this practice by the former, Mr. Kentiſh thinks it neceſſary to the ſupport of his new doctrines, to ſhew in what reſpects Sir James Earle's is deficient or fallacious. Without acquieſcing in what is *ſevere* in theſe ſtrictures, we ſhall endeavour to ſhew what are the merits of the application of cold to burnt parts, by quoting ſome of Mr. Kentiſh's obſervations. "Having," ſays he, "made theſe preliminary obſervations, I ſhall proceed to reviſe ſome of the theoretical and practical doctrines of Mr. Earle, as given in his eſſay.

"He begins by lamenting the want of principle in the treatment of ſuch accidents as happen from the influence of fire upon the human body, both in the ancient and *modern* authors upon this ſubject: he likewiſe notices ſome of the moſt common and contradictory applications, and adds that many more formulæ might be enumerated; that in general they are intended to cool, relax, or give eaſe; and that in ſome meaſure they anſwer theſe purpoſes, but do not furniſh effectual means to ſtop the progreſs, or leſſen the powerful action of the *matter* of fire, which probably continues to *exiſt* in the burnt part, and to extend its influence for ſome time. This opinion of the matter of heat I have mentioned in my former eſſay, ſpeaking of Fourcroy's recommending the fluor volatile alcali as an application to burns, which he ſuppoſes may unite with ſome diſengaged matter of heat, previouſly to its having time to combine with the animal fibre: Chaptal appears to be of the ſame opinion: but I have there ventured to diſſent from theſe enlightened chemiſts, looking upon heat as an effect produced by the motion of the particles of matter changing their ſtate from a gaſeous to a liquid or a ſolid form. But whether it is a material body, or only the effect of chemical changes in other bodies, ſeems to be of little conſequence in the preſent diſquiſition: let this abſtract queſtion be determined by the chemiſts. When they ſhew me the matter of heat palpable to the ſenſes, in a fixed ſtate, I ſhall be a convert; until then I may perhaps remain a ſceptic. We need only obſerve its effects as influencing a ſeries of actions in the animal œconomy, actions which differ according to the degree of heat, and its duration, following the laws of animated nature. All other than theſe

effects are incapable of proof, and may lead us wrong, therefore ſhould be avoided.

" The firſt caſe Mr. Earle relates is one which happened ſome years ago to a medical gentleman: being near a bottle of ſpirit of wine which was imprudently heated, and by ſome accident caught fire, the bottle burſt, and the contents were thrown over his hands, face, and the upper part of the neck, all of which were miſerably burnt. ' At a conſultation,' ſays Mr. Earle, ' on this unfortunate caſe, the uſual modes of treating burns were diſcuſſed; and from a thorough conviction of the little good to be derived from the applications in common uſe, it was agreed that after the loſs of ſome blood, cold water alone ſhould be applied to bathe the parts; and this being found to give eaſe, was conſtantly renewed; and the patient during ſeveral days *drank* nothing but *cold water*, and took *very little* nouriſhment. By theſe means he was kept in a cool and *tolerably* eaſy ſtate, though the pain *often* returned at ſhort intervals; ſome bliſters aroſe, which however in *little more* than a week ſubſided, and no ſcar was produced.'

" After this caſe, Mr. Earle narrates that of the illuſtrious Boerhaave, which happened from the burſting of Papin's digeſter. It was treated by profuſe bleeding, purging, low diet, and externally by the ſofteſt oily applications to be found in the ſhops. It was cured after a tedious ſuppuration, and with an unſightly ſcar. It is here brought into parallel, with a view to ſhew the ſuperiority of *cold* applications over unctuous or greaſy ones, as in every other reſpect the treatment was nearly ſimilar—bleeding in both, cold drink, and very little nouriſhment."

Mr. Kentiſh, after wiſhing that this caſe of the medical gentlemen had been drawn up with more exactneſs, proceeds thus:

" I have wiſhed in my eſſay to bring into compariſon thoſe extenſive injuries only, where life or death would be the reſult of different practice. Such caſes have been related; and if from experience I am enabled to aſſert, that a caſe will terminate in the loſs of life, or the reſtoration of health, according to the mode of treatment purſued, I think I may fairly be allowed to conclude, that a procedure upon the ſame principle in injuries which would not affect exiſtence, would have a proportionate degree of ſuperiority over thoſe which would extinguiſh life, were it primarily in danger. To have advanced thus far, appears to me to be as much as can be expected in a *conjectural art*, even if it does not place it on a *firmer* baſis, and reſcue it from that *opprobrious title*.

" After a diſplay of this caſe, in which cold water produced ſuch effects, Mr. Earle confeſſes, ' though this plan well followed up and renewed as often as poſſible, leſſened the pain, and abated the heat, it did *not quickly ſubdue them*; and in large and ſevere burns it ſeemed *diſproportioned* to the violent effect produced by the fire.' The next caſe related is that of a lady who had her neck and face

much injured from the burning of her neckerchief. There was a conſultation on this caſe, at which Sir Walter Farquahar was preſent. He propoſed the application of ice to all the burnt parts, although they were very extenſive. Mr. Earle's predilection for cold applications induced his immediate aſſent, and ice was accordingly applied; which *appearing* to give immediate eaſe, was continued unceaſingly during ſeveral nights and days; after which the lady recovered without any ſcar remaining, or any injury to her health from the cold ſtate in which ſhe ſo long remained. This caſe is evidently, as was the laſt, drawn up from recollection, and little can be gathered of the ſtate of the lady from what is related: that ſhe had ice applied to her for ſeveral days, and that ſhe avoided any ill conſequence from it, we are told; as alſo that ſhe afterwards, i. e. I ſuppoſe, after they ceaſed applying what is termed the remedy, recovered without any ſcar remaining. But of what did ſhe recover? Were the parts bliſtered, or were they deſtroyed? Was there ſloughing, or a purulent diſcharge (ſecretion) from the ſkin; and how long *after* was it before ſhe was well? Of all theſe particulars we are uninformed, and without ſuch information no juſt judgment can be made. It perhaps is one of the moſt difficult parts of a profeſſional author to convey *preciſe* ſtatements of particular actions in injuries happening to individuals under their care; but here there is no attempt of the kind; every thing is rounded off by general aſſertions.

"A child of Mr. Earle's, about three years of age, playing with his brothers, was thrown down upon the hearth: to ſave himſelf, he caught hold with one hand of a hot bar of the grate. His father ſaw him in leſs than a quarter of an hour after; he was in exquiſite pain, although the nurſe had wrapped his hand in oil; ice was inſtantly ſent for, with which his hand was covered, and he got immediate eaſe; but as ſoon as the ice was melted, which was at firſt in a ſhort time, the pain returned, and he cried out for more. A *bliſter* aroſe [*Here Mr. Kentiſh remarks the inſufficiency of this practice to prevent the riſing of bliſters*], which by degrees, in one large bladder occupied the whole of the palm of the hand, and the inſide of the thumb and fingers, and it increaſed ſo as to become globular, and nearly of the ſize of a hen's egg. The opening or breaking of this was moſt carefully avoided, and ice was conſtantly applied to the whole hand, it being immerged, during the day in a baſon of ice and ice water, and at night wrapt in cloths, or covered with ſcraped potatoes, ſoaked in it. Whenever this application was recent, the child was eaſy and ſlept; but at intervals, as the hand grew hot from the melting of the ice, he became reſtleſs, and cried until it was renewed, when his ſleep was again compoſed. This plan was purſued during a week, at the end of which, an abſorption of the extravaſated lymph took place; the cuticle which had been elevated to ſo great an extent, began to

ſhrink and ſhrivel; in a few days it became ragged and torn, and was taken away without any painful ſenſation, a perfectly well healed ſurface appearing underneath.

"This caſe, it appears, has been attended by Sir Walter Farquahar, to whom Mr. Earle expreſſes his acknowledgments for his kind attention, alſo for being the firſt who ſuggeſted this mode of treatment. Their converſations frequently turned on the efficacy of the means employed, and they mutually regretted that this practice was ſo little known. This ſeems to have induced Mr. Earle to take up his pen upon the ſubject. He makes the following obſervations upon his ſon's caſe: 'If I am allowed to judge from the ſeverity and ſituation of the burn, and from the ſoft and tender ſtructure of the parts concerned in the caſe juſt deſcribed, and to reaſon from what I have ſeen in many others, I am decidedly of opinion that, had it been treated by *any* of the means commonly employed, the inflammation would have riſen much higher, and continued much longer; conſequently the pain would have been more ſevere, and of longer duration, accompanied with fever. From the greater degree of heat, and irritation, the bliſter would have continued to increaſe, and, if the intentional opening of it, which by ſome was adviſed, had been avoided, it would have burſt; the admiſſion of air would have produced a ſlough, in which the tendons would have been implicated; in conſequence the muſcles, no longer ſerviceable, would have become contracted, and the hand for ever been left maimed and uſeleſs.'—Such are the concluſions attempted to be drawn from this caſe: I muſt confeſs the premiſes do not appear to warrant them; I muſt therefore beg leave to draw the reader's attention to ſome of the facts as ſtated above, from which I ſhall be induced to draw very oppoſite inferences. It is ſaid, 'a *bliſter aroſe*, which, by *degrees*, in one large bladder, occupied the whole of the palm of the hand, and the inſide of the thumb and fingers.' From this it appears that the extravaſation of lymph had not taken place when the ice was firſt applied. I ſhould therefore conclude that ice applied to a burned part will not excite the abſorbents ſo as to keep up the equilibrium of action between them and the ſtimulated exhalents, upon which, in this ſtate of the irritated ſurface, chiefly depends the cure. I have frequently ſeen veſications quickly reabſorbed by the uſe of the ſtrongeſt ſtimulants; and in general bliſters are prevented from forming after their application. From ſeeing ſuch effects from known and demonſtrable cauſes, I cannot but ſuppoſe that they muſt ariſe from ſome certain laws of the ſyſtem; and as nature has allowed herſelf to be ſeen in theſe proceſſes, I bow with ſubmiſſion to her decrees, and look upon it as the higheſt honour mortals are allowed, to become her interpreters. For an explanation of thoſe laws I refer the reader to what I formerly advanced on the effects of heat, &c.

« In this case Mr. Earle has given me some certain data to form a judgment upon. The formation of a blister is with me a determined *point* to judge of the extent of the injury in that part. This accident classes with those in which there is an increased action, but no destruction of the parts. Had the cutis itself been destroyed, there would have been no blister; the blister therefore demonstrates the extent of the accident; and in this case I can venture to assert, with the same conviction in my own mind, that *none* of the tremendous consequences pourtrayed by Mr. Earle would have happened, as I can, that two and two make four. Whatever mode had been followed, the child would have recovered; and I believe if nothing had been done, he would have been well as soon. I do not see the reason why the opening of the blister was so much dreaded: irritation on any part of the surface, so as to produce the action of the exhalents to throw out serum, appears to me to be nearly the same, whether it arise from cantharides, mustard, hot water, heated substances, &c. &c. Now we know it formerly was the custom in taking off a blister to take away the whole of the cuticle, and rub the bare cutis with a coarse towel. From this rough treatment no ill consequences arose; a greater secretion of pus might be the effect, but I never heard of the deeper seated parts being in any danger from such irritation. With such views, and such experience, I hope my conclusions will not be deemed improper, should I even venture to say, that had the mode pointed out in my former essay been followed, he would have been well in half the time; in short, I might almost assert he would not have been ill: for had the part been well bathed with spirit of turpentine, covered with a thick plaster of digestive ointment softened with the same spirit, a poultice of bread and milk applied *hot* over the plaster, and a spoonful of white wine, with ten drops of Tinc. Opii been given, and the child put to bed, at the end of twenty-four hours there would have been no vestige of the accident.

« Several cases are then related, in which ice produced, according to the statements, the most salutary effects; but lest I may be thought too minute in this discussion, I shall pass them over, and go on to the case of a poor woman, who, in a fit, fell into the fire. The injury extended over the whole of the neck, back, and breasts; in short, nearly half the body was scorched, and there was one continued burn, which made a surface, by measurement, of more than four hundred inches. A considerable time had elapsed after the accident, before she was brought to the hospital, so that the heat of the fire had had scope enough to do great mischief; added to this, the *inflammatory* attack had been aggravated by the *injudicious* application of spirits of turpentine, so that her sufferings were extreme. The burnt parts were covered, as soon as possible, with pounded ice, and ice water, from which she found immediate ease,

and lived three weeks without complaining of much pain, and without that diſtreſſing fever which uſually accompanies ſevere burns; after which *ſhe ſunk*, under the *profuſeneſs* of the *diſcharge* from ſo large a ſurface, and expired. Mr. Earle then adds, that it is impoſſible to ſay what a more early application of ice might not have effected; but in his opinion much greater advantage would have been attained, ſince in other inſtances, where it has been applied early, although the burn has been both extenſive and deeply inflicted, a ſtop has been put to the heat and inflammation, and ſloughs have been prevented from forming. But conſidering this caſe abſtractedly, if ice could act with ſuch effect as to keep this patient ſo long alive, and eaſy, what may not be *expected* from it in ſlighter burns?

"The foregoing caſe induced Mr. Earle to make the above obſervations; to which I muſt requeſt the reader's permiſſion to add a few remarks. Thoſe parts of the caſe to which Mr. Earle thinks his want of ſucceſs was *chiefly* to be attributed, viz. the *application* of *ſpirit of turpentine*, and the *length of time* which elapſed before the uſing of the ice and ice water, appear to me to be the chief cauſes of the *ſucceſs* he had in this caſe: for I muſt, knowing what I do, term it ſucceſs to have brought the parts to a ſtate of ſecretion.—We are not informed concerning the mode of treatment after the proceſs of ſuppuration commenced; but from the account, we have reaſon to conclude that the ice was continued during the whole three weeks of her exiſtence, as we are never told of its being deſiſted from. Now I can eaſily ſuppoſe the theory of abſtracting the redundant portion of heat from the ſyſtem, during what is called the inflammatory *attack*, but I do not ſee the neceſſity of continuing the ſame means when the ſyſtem is going through a various circle of actions, which require very different means to keep up the utmoſt of her powers in each. Thoſe who wiſh to be informed why, and upon what principles, I ſuppoſe beneficial effects to have ariſen from what Mr. Earle imagines to have produced the contrary, I recommend to read my former eſſay, where they will meet with a full explanation. If, as in this caſe, I very much doubt of the advantages of the application of ice, I muſt alſo be allowed to doubt of its uſefulneſs in caſes of leſs magnitude; for I look at it *abſtractedly*, and as I find it contrary to principle in one inſtance, I conclude it is the ſame in all."

On one caſe more, related in Sir James Earle's eſſay, Mr. Kentiſh beſtows ſome attention. The lady writes to him thus:

"Early in the month of March, 1792, one morning juſt after breakfaſt, I went into the parlour to ſpeak to my mother, who was ſitting by the fire-ſide, ſo that I ſtood on the hearth with my back to the fire; and as ſoon as I had communicated what I had to ſay to her, and my ſiſter, who was with her, I was going to quit the room, when the latter looking up, perceived that the back of my

dreſs was on fire. Fright deprived her of all power to act, but my mother immediately endeavoured to extinguiſh the flames by wrapping her clothes round me, but in vain; the fire was become too ſtrong; and as ſhe concluded the carpet was nailed to the floor, ſhe went out of the room to get ſomething to throw over me; my firſt impulſe was that of following her, when, providentially, I had the preſence of mind to ſee that ſuch a ſtep muſt prove fatal; and throwing myſelf down on the carpet, I rolled over and over, begging my ſiſter would try and cover me with it; which ſhe could not do, being deprived of ſtrength by her fear; my mother ſoon returned with a large mat; and the ſervants, who had been alarmed by my ſcreams, came in at the ſame inſtant to my aſſiſtance; they threw the mat over me, and themſelves upon it, in order to ſmother the fire; and after ſome little time ſucceeded; but not before I was ſeverely burnt in two places in the ſmall of my back, the back of my neck, and the under parts of both arms juſt above the elbows. I had burnt the fingers of my right hand, in attempting to untie my muſlin ſaſh. My mother's hands alſo ſuffered; as on raiſing me from the floor, ſome fire blazed from the back of my handkerchief and cape of my gown, which ſhe ſtroked down from my head, and preſſed out with her hands. When I had a little recovered from the ſhock, I ſent off directly to requeſt the favour of Mr. Farquahar (now Sir Walter Farquahar, M. D.), if at home, to come to me immediately; if not, that he might be informed of the accident as ſoon as he returned, and that I was impatient to ſee him; three or four hours having elapſed, I ſent again to Mr. F. and as he was not come home, one of the gentlemen from his houſe very obligingly came to me; yet I *declined* availing myſelf of his advice, being *determined* to wait till Mr. Farquahar could come to me, owing to the anxious wiſh I had of having his opinion and advice in preference to all others. In the mean time I had applied ſcraped potatoes to my hand, and ſome oil to the reſt of the burns. About ten o'clock in the evening Mr. Farquahar arrived; and after he had ſeen the places which were burnt, he ordered ſome ice to be ſent for inſtantly, and that I ſhould have ſomebody to ſit up with me all night, who was to keep conſtantly applying to the burns cloths *dipped* in the ice, and to be changed as ſoon as the chill went off; that if I became weary, and could ſleep, they ſhould get ſome freſh hog's lard, and firſt waſh it extremely well with water; after which it was to be beat up with ice ſpread on linen, and laid on the burns; but as ſoon as I waked, to uſe the ice ſimply as before. When Mr. F. left me, I had my bed immediately laid on the floor, as being more eaſy and convenient to thoſe who attended me, and ſtrictly followed Mr. Farquahar's directions the whole night. On firſt applying the ice, it made me *ſhudder* for a minute or two; but the *pain* I felt was ſoon abated, and in the courſe of the night I got a little ſleep. At noon next day, when Mr. Farquahar came, he

found me in a fair way of doing well, and only requeſted I would perſevere in applying the ice frequently, and in the intervals keep the hog's lard and ice to the burns. I ſoon experienced the benefit of this method of treatment, for in a few days the fire was entirely *drawn* out, and though *all* the *bliſters* had *broke*, *not one* of them had the leaſt tendency to become a *ſore*. [*This would appear to contradict the terrible conſequences that Mr. Earle predicted, ſhould the bliſter have broke ſpontaneouſly in the caſe of his ſon's hand.*] Conſidering how much I was burnt, the pain I ſuffered was comparatively trifling [*From what could this lady judge? It does not appear ſhe had ever been burnt before, or ſeen others who had*]; which I am *perſuaded*, was entirely owing to the application of the ice; and my mother, who alſo uſed the ice to her hands, was cured in a few days. In the courſe of a *month* or *five weeks* I perfectly recovered, and have never ſince ſuffered the ſmalleſt inconvenience from that accident; nor did I at the time catch any cold, though I ſat up for the moſt part of the firſt night, with ſcarce any clothing, and as the ice diſſolved, of courſe I was very wet [*This account does not ſpeak much for the comfort of this practice to the individual's feelings*]; and although I had before this accident, been for more than two years greatly indiſpoſed by *nervous* complaints, I had not any fit, or thoſe nervous ſymptoms which my friends were apprehenſive would have been the caſe, after the terror and fright I ſuffered by the accident."

Mr. Kentiſh does not ſeem inclined to conſider this lady's narrative with ſerioufneſs, as appears from his intervening remarks. Nor does he coincide with the two eminent medical knights, when it appears, they conſider fire as a body which enters, or rather unites with part of the ſyſtem, and which is *drawn out* by any body, having a *ſmaller proportion of caloric*, and therefore capable of receiving moſt quickly the ſurplus of heat in the part affected. Sir J. Earle ſays, "from every obſervation I have made, the fire does not produce all its effects on the firſt attack, or immediate contact with the part; but afterwards lies *rankling* in it, and continues to ſpread its deſtructive influence until its *fury* is ſpent, or its power counteracted, as is evident from the continuance and even increaſe of the exceſſive pain and inflammation."

Mr. Kentiſh having at ſome length reviewed the pamphlet in queſtion, and combated the principle upon which the practice of cold applications is founded, proceeds to relate ſome caſes which he thinks ſtill further demonſtrate its fallacy, and eſtabliſh the *oppoſite principle* upon a firm baſis. As the object is of no ſmall importance, we ſhall introduce them here.

"Some of the following caſes," ſays Mr. Kentiſh, "have happened under my own eye, and others are related by gentlemen of whom I have no knowledge, and over whom I certainly can have exerciſed no influence. Their unbiaſſed teſtimonies, therefore, wil

add considerably to the importance of the evidence, particularly with that class of readers, who judge merely from consequences. To the admirers of principle in medicine as well as in other sciences, it must give infinite pleasure to see that the beautiful movements of the animal economy, which medical philosophers in their closets have supposed to exist, are here displayed, and proved by careful attention to phænomena that appear during the different stages of dangerous actions in the system; and that by different treatment during those stages, the individual may be restored to health, or the living power exhausted to death.

"The following case, which was communicated to me long before the publication of Mr. Earle's book, bears so strongly on the point in question, that I have much pleasure in laying it before the public. We have here from accident, what the most candid practitioner would have wished from design, had a comparison been desired of the efficacy of the different modes. The case is thus related by Mr. Anderson, surgeon, of Newcastle upon Tyne:

CASE. "A lady, in endeavouring to remove a pan from the fire which contained boiling fat, had the misfortune to receive some of it on her right arm and face: I saw her a few minutes after the accident, about nine o'clock in the morning; she was sitting on the floor, and her arm was immersed in a pail of cold water; her face was flushed and appeared much scalded, and she complained of great heat and pain. I immediately applied the ol. terebinth. to it, and continued it for a few minutes. She said that her arm was so much relieved by the water, and that it had succeeded so well in a former accident, that she wished to continue it for a few hours. I saw her about four o'clock in the afternoon, her face looked much better, and was easy. She had continued the immersion, *often* changing the water; but when her arm was taken out, though only a minute, she complained much of the pain; *indeed* it appeared that the inflammation was increased. I recommended an emollient poultice, after she should be tired of the cold water. In the morning I called again, and was informed that the pain of her arm had been great during the night. The inflammation had extended above the elbow, several large vesications had been opened, and deep sloughs formed on her hand and arm. I applied a digestive ointment to these parts, and a large warm poultice over the whole. The face was perfectly easy, and had no vesications, but the cuticle was a little abraded. I scarcely need add that the arm required dressing daily for a fortnight after the accident."

Mr. Kentish adds that this report was given to him, and has been in his possession since the year 1798; and he thinks the facts so clearly stated, and the conclusion so obvious, that it is almost unnecessary to make any remarks upon the case.

Defending himself against a surmise of the authors of the Medical and Chirurgical Review, who have supposed him more governed by

theory than practice in his diſlike to cold applications, Mr. Kentiſh relates the following caſe that happened to his aſſiſtant Mr. Bell. He had the back of his hand ſeverely ſcalded by ſteam between nine and ten o'clock in the morning, in the ſummer of the year 1792, and being partial to cold applications from ſome preconceived theory, immediately after the accident plunged it into a jar full of aqua lithargyr. acetat. comp. which he renewed as often as it became warm. This was continued during the whole day: at night it being painful when taken out of the cold liquid, folded rags wetted with the mineral water were applied at bed-time, and thirty drops of tinct. opii taken. Notwithſtanding theſe means, it interrupted his night's repoſe, and frequently required freſh wetting. On the following morning it was bliſtered, and pretty eaſy, until he had occaſion to ride a few miles into the country, when the pain returned, though not ſo violently as at firſt. On his return he again reſorted to the jar of cold liquid, and in about two hours he was free from pain. Nothing further remarkable happened.

"The reviewers obſerve," ſays Mr. Kentiſh, "We cannot help ſuſpecting, that the author's objections to the uſe of cold applications are more the conſequence of a previous theory, than founded in accurate obſervation of their full effects. The uſe of cold water in burns ſeems to us to be eſtabliſhed on the ſureſt foundation of *facts;* although it muſt be allowed that there are caſes in which, from the great extent of the injury, as well as from *other cauſes*, it may be inapplicable, and therefore it may be deſirable to have other remedies, to which we can occaſionally recur.' If theſe gentlemen will look at the above caſe, they will ſee my opinions were not drawn from mere theory in reſpect of cold applications: beſides, I have in more extenſive burns, viz. in collieries, tried the effects of the aqua vegeto mineralis applied cold with rags wetted, which has always momentarily been attended with that deception of ſenſe, viz. producing eaſe, though it has *ever* been followed in my ſphere of experience, by a greater ſubſequent degree of pain."

Mr. Kentiſh next remarks on ſome farther ſtrictures of the Medical Reviewers, who are inclined to defend the practice of cold applications. They ſay, "even admitting the author's theory, that the cure depends on inducing a unity of action between the injured part and the ſyſtem, the local application of cold may be defended; for the power of cold in leſſening action is admitted, and by this means the exceſſive action of the part may be reduced to its proper level."—"What is here meant by cold?" obſerves Mr. Kentiſh. "I have wiſhed to avoid the confuſion ariſing from indefinite terms. If they mean by cold, the application of water at 40 deg. to a ſurface injured by water heated to 212 deg. which I ſuppoſe they do, I affirm it is not compatible with my theory, nor with my practice. To apply water at 200 deg. in ſuch caſe is 12, degrees of cold; but ſuch is the ſtate of our language, that if we

do this, we ſay that heat, or a violent ſtimulating application, is uſed; yet it is evident that it is not a ſtimulus in compariſon with that which cauſed the injury, but is applied to prevent the *too ſudden* diminution of the violent action cauſed by the injuring ſtimulus: now the application of cold water in the common acceptation of the term, cauſes the very *injury itſelf* which the whole of my practice tends to obviate."

Mr. Kentiſh calls the application of cold water the cure by *paralyſis*, and ſays, he has been informed by a gentleman who has been ſtudying at Edinburgh, that this treatment is in general uſe there. A lady of that city who had been ſcalded in her foot, kept it immerſed in cold water, frequently renewed, for three days, and the two intervening nights. "Even admitting the power of cold," ſays Mr. Kentiſh, "to cure burns by ſuch a *continued application*, it could only with ſafety be allowed to very limited injuries; for in caſes which frequently occur in collieries, of men *engulphed in liquid fire*, nothing ſhort of a cold bath could apply to the whole of the injured ſurface, and ſuch an application for ſuch a length of time, I apprehend would be fatal."

We find in the Memoirs of the London Medical Society, a paper which was read to the ſociety in 1780, by Mr. Lowdel. In this, cold applications are recommended in burns: he ſays, "A lady's head dreſs having took fire, his hand was much burnt in extinguiſhing it. Finding his pain much relieved by applying cold oil, he immerſed his hand into a large pot of oil, and the interval of eaſe became longer. He afterwards uſed a poultice of oatmeal, extract of lead, and oil, on going to bed, and waked next morning free from complaint, except that two ſmall bliſters remained, which afterwards gave him no trouble."

In the 5th volume of the ſame Memoirs, ſome caſes are alſo related by Mr. Parkinſon, of Leiceſter, in which *cold produced by the evaporation of ſpirit of wine*, is recommended, in preference to the uſual mode of applying it.

Case I.—A young woman had her face, neck, ſhoulder, and part of the abdomen, ſcalded by hot water. The uſual *oily* applications had been uſed for two hours previous to the author's viſit. During twenty-four hours a pint of ſpirit of wine was conſumed in moiſtening the affected parts, which were firſt covered with bladder. "Whenever the operator deſiſted for a little, pain recurred with ſeverity, but ceaſed upon reapplication of the means. The excoriated parts, which were much leſs than might have been expected, were dreſſed with common white cerate, under which they ſpeedily healed."

Case II.—"By the exploſion of ſome gunpowder, a young man, a blackſmith, was terribly burnt: having his coat off, his ſhirt took fire, and increaſed the ſeverity of the accident. The parts injured were firſt waſhed with warm milk and water; rags ſpread with cerate

were next applied, and on the outside of this application spirit of wine was unremittingly used for twenty-four hours. This produced ease, with considerable abatement of inflammation. This plan was pursued till the evening of the third day. Two quarts of spirit of wine were consumed; the deep sloughs were dressed with soft digestive; a cooling purge was given; and wax and oil completed the cure. No deformity of consequence remained." Some more cases of smaller import are added.

On the last of these details Mr. Kentish remarks, that Mr. Parkinson's disappointment in the common mode of applying cold by saturnine applications, &c. arose from his own mistake in drawing his conclusions of the effects of alcohol. "I rather suppose," says he, "the *stimulant* effect of that application would have a considerable share in producing the good consequences Mr. Parkinson relates, notwithstanding the care taken to prevent its entire good effects by intervening media."

Several cases of the supposed benefit arising from cold in burns may be seen in Mr. Kentish's first essay, page 44, in a memoir from La Medicine Eclairée. We shall now proceed to speak of that gentleman's mode of treating burns by the use of local and constitutional stimulants.

Sect. III. *On the Treatment of* Burns *by stimulating Remedies.*

Mr. Kentish, who has introduced to general notice this most valuable improvement in the mode of treating burns, has, from his vicinity to the coal mines, where accidents frequently happen from the explosion of inflammable air, a most extensive practice in this branch of surgery; and, from what has been already said, it must appear, that his experience and ingenuity claim the most candid attention and examination of his brethren on this subject. He judiciously remarks, "that if men would, in general, confine their efforts to a few points, science would make a more rapid progress, though there might be less brilliancy attached to individuals. It is by a division of labour that perfection is to be attained in the scientific, as well as in the mechanic arts."

In order to demonstrate the principle on which Mr. Kentish directs the application of stimulants to burns, we quote the following passage: "I have mentioned at some length the effects of different degrees of temperature upon the animal system. It will there appear, that animals endowed with the property of life have a power of preserving their existence under a varied degree of temperature proportioned to the perfection of their organization; and, if gradually applied, the extent of the scale is greater. Man will exist from zero to two hundred and sixty degrees of Fahrenheit's thermometer; though rapid changes, much within that range,

will deſtroy him. Such is his glaſſy eſſence, that it appears neceſſary to treat him as artiſts do that ſubſtance, viz. to anneal him, by allowing his temperature to be changed gradually. Such is, in ſome delicate conſtitutions, the narrow ſcale of accommodating power in the ſyſtem, that a change which appears inſenſible to perſons of a more healthy frame, produces ſuch diſturbance in the actions of abſorption and ſecretion, as to bring on complaints of the moſt ſerious nature. Delicate ladies who keep cloſe within the houſe, in going from one room to another, bring on that ſtate of the ſyſtem known by the term of catching cold. This ſtate is alſo very frequently induced by a too ſudden and great application of the ſtimulus of heat, after the torpor induced from lowering the temperature only a few degrees. The effect of a diminiſhed quantity of heat is proved, by the facts adduced by Mr. Hunter, of the rabbits' ears, to have ſtopped all action in the part; and the effect of increaſed heat applied to my own body, proves the increaſed action induced by heat. I do not mean by this to deny the power of fire combining with and decompoſing any part of the ſyſtem to which it has been ſo applied. I am well convinced I could burn my finger off over an Argand's lamp; but, after this decompoſition, I ſhould not expect that ice would draw out the caloric, and reſtore me my finger. When caloric combines with any ſubſtance, a chemical union takes place; and when this is done with the living animal fibre, it is at the expence of a deſtruction of organization, which no human art can reſtore in that individual fibre. Yet, ſuppoſing a finger, or part of a finger, to be ſo deſtroyed, there muſt have been increaſed action previouſly to deſtruction; and where deſtruction ceaſes, increaſed action, from this greateſt of all known ſtimuli, will begin. Now, as I think it will be granted that parts cannot be reſtored, thoſe which we have to take care of muſt claſs under the head of parts with increaſed action. If this be admitted, I believe I have formerly pointed out the beſt known modes of treatment. What to me is one of the moſt convincing proofs of the truth of the principles I wiſh to be made known is, that the inverſe of them is proved to be true by the experience of all countries ſubject to a diminiſhed temperature; and, reaſoning upon the ſame data, Mr. Earle's principle muſt be erroneous: for inſtance, if in a *plus* of heat it ſhould be drawn off by cold, in a *minus* of heat it ſhould be added by the body which is the readieſt to part with its heat. The following caſe will illuſtrate theſe principles: In the beginning of this year (1800) there was a ſevere ſtorm, in which many ſhips were loſt upon the coaſt of Northumberland, and a great number of men periſhed from the intenſity of the cold. Three were taken to a ſmall inn in a fiſhing-town on the coaſt, and as one was very much froſt-bitten, with the beſt intentions in the world the good people of the inn prepared a hot bath for him, in which having kept him a ſufficient time, they

put him to bed, and gave him ſome hot ale and brandy. The conſequence of this treatment was, that the torpid actions of the ſyſtem were ſo rapidly put in motion, that the vital power was exhauſted in forty-eight hours, and the man died. The others, who fortunately had not ſo much falſe care beſtowed upon them, recovered with difficulty; for, although they did not uſe the bath, they had a ſhare of the other ſtimuli applied, ſufficient to produce pernicious effects. Now, had Mr. Earle's principle been right, the man would have lived, as they took the readieſt way of applying, both externally and internally, the *deficient heat*. Had the oppoſite practice been uſed with this man, I have very little doubt but he would have recovered: the froſt-bitten parts (the extremities, both ſuperior and inferior) ſhould have been thawed in water not above forty degrees; he ſhould then have been put into a cold bed, in a room without a fire; and, if he had been allowed any ſtimulating drink (ſuch as ale), it at leaſt ſhould have been cold: but of the propriety of allowing, at an *early* period, even this ſtimulus of *cold fermented* liquor, I have my doubts. For the danger of allowing too great ſtimulus after what is termed an accumulation of irritability, I refer the reader to accounts of ſhipwrecked people: the narrative of the loſs of the Bounty will ſupply them with ſufficient obſervations on this head."

In a ſecond eſſay, the ingenious author purſues the principle of treatment recommended in his former one, though in the detail of practice he has been induced to make ſome alterations, which he thinks highly advantageous. He ſays, "In the firſt ſpecies, where the action of a part only is increaſed, I have not found any thing better for the firſt application than the heated ol. terebinth. and the digeſtive thinned with the ſame. In ſuperficial burns, when the pain has ceaſed, it will be adviſable to deſiſt from this application in about four-and-twenty hours, as that time, in many caſes, will be ſufficient, and at the ſecond dreſſing a digeſtive ſufficiently thinned with common oil, will be adequate to the caſe; and on the third day to begin with the ceratum e lapide calaminari. I have frequently ſeen ſecondary inflammation excited by the remedy, which, in the firſt inſtance, puzzled and perplexed me conſiderably: I have likewiſe been informed of this conſequence by ſeveral gentlemen. The moſt certain remedy for this unpleaſant ſymptom is to apply a plaſter, with digeſtive thinned with oil, or a plaſter of cerate, and over that *a large warm* poultice. This moſt effectually takes off the irritation of the part, and the cerate will finiſh the cure. Should there be much uneaſineſs of the ſyſtem, an anodyne proportioned to the age of the patient ſhould be given."

The following extracts from the firſt eſſay will exhibit Mr. Kentiſh's practice in detail. He ſays,

" Of thoſe caſes where the action of a part is only increaſed. To enable us to give a clearer deſcription, it will be neceſſary to divide the treatment into two parts, namely, the external and internal."

1ſt, *Of the external means* Mr. Kentiſh ſays:

" When the ſyſtem is expoſed to a certain degree of caloric (heat), all its functions are performed well. If the heat applied to any part ſhould be gradually increaſed, the action of that part is likewiſe increaſed, which, if in a ſmall degree, and long continued, would produce various effects upon the reſt of the ſyſtem: but it is not this degree I am now to deſcribe; it is a ſudden application of a quantity of diſengaged or combined caloric to a part, which throws it into a violent ſtate of action, according to the ſtructure of the part injured: this takes place ſometimes from the combuſtion of inflammable gaſſes, as in mines, or the exploſion of gunpowder, and, at other times, from heated or boiling fluids, ſuch as oil, ſteam, water, &c. or from heated ſolid metallic or ſtony bodies. The extent of the injury may be eaſily judged of from the appearance of the parts, except, as in the inſtances of the miners, where the cuticle is ſo filled with fine coal duſt, as to render them quite black; but the feelings of the unhappy ſufferers will prevent your neglecting any part which has been hurt; it will always, however, be better to apply the remedy to parts that have not been hurt, than to neglect any that have. The next dreſſing will ſufficiently point out to you if you have either been too profuſe or too negligent; but, as the intolerable pain is ſuch, there is no fear but you will be called in as ſoon as poſſible. If veſications have begun to form, trouble neither yourſelf nor the patient to open them, as your time may be more uſefully employed. If the cuticle ſhould be lacerated in any part ſo as to expoſe the ſkin, it need not make any difference in the means uſed, as the extent and pain of an injury which has detached the cuticle, by means of the violent application of heat, will not be increaſed, even in pain, from any application I have ever yet ſeen uſed.

" Take a tea-cup, and put ſome of the beſt rectified ſpirit of wine, or ſpirit of wine with camphor, or ſpirit of turpentine, into it, then place it in a baſin of hot water, ſo as to heat it to what you can bear with your finger; then, by means of a rag dipped in this, or a probe armed with a good deal of lint, waſh and bathe the whole of the injured ſurface, which, when done two or three times over, apply plaſters to the whole, formed in the following manner:

" Take of the common yellow baſilicon according to the occaſion; let it be mixed up with as much ſpirit of turpentine as it will take to make it of the conſiſtence of a liniment, which, when ſpread upon thin old cloth, is to be applied to the part; the wax

and oil of the baſilicon will fill up the pores of the cloth, ſo as to prevent evaporation, by which means the ſtrong ſtimulant powers of the turpentine, or alcohol, or camphor, or all together, are ſo confined upon the ſurface, as to excite the abſorbents to the very increaſed action we wiſh; and when this has taken place, the ſmall quantity of oil is ſufficient to preſerve the cuticle in a pleaſant ſtate.

"I have not found the ſtrict order given by former authors of very frequent dreſſings ſo neceſſary as they inculcated, nay, on the contrary, I have found them prejudicial; for the very quick evaporation that takes place on expoſing or uncovering the ſurface any time during the firſt four-and-twenty hours is pernicious; I therefore only dreſs the patient once a-day, even at the firſt, unleſs in ſome inſtances. If the accident ſhould happen early in the morning, he may be a ſecond time dreſſed in the evening, but even that indulgence is more in compliance with the prejudices of the patient and his friends, than from any advantage I have ever obſerved to ariſe from it. If he will ſubmit to it, it will be better to allow him to remain for the firſt twenty-four hours without being diſturbed; if the plaſters are ſpread tolerably thick with the ointment, there will be no need of uſing any further means until the next dreſſing. On the following day, when you are going to dreſs your patient, the firſt thing to be done is to have your plaſters ſpread before you begin to take off the others (they are to be ſpread with the digeſtive liniment, the ſame as at the firſt dreſſing); and then not to take off more than one at once, as the leſs time the parts are expoſed to the action of the external air the better. It will ſeldom be neceſſary to have recourſe a ſecond time to the application either of the pure heated alcohol, or camphorated alcohol, or ſpirit of turpentine, as the redneſs or apparent inflammation will appear much leſs vivid; it will be neceſſary, therefore, to diminiſh your exciting means, as the action diminiſhes; ſome proof ſpirit, or ſome laudanum with the coldneſs taken off, will be ſufficient for this dreſſing, and the plaſters immediately applied: they ought to have been ſo near a fire as to make them near the temperature of the patient's body, to avoid any chilline ſs ſucceeding their application: this being done, your patient is to remain quiet for twenty-four hours longer, at which time you will generally find that the appearance of inflammation has diſappeared, and where there had been any ſmall veſications in the firſt inſtance, there will be ſeen ſuch a ſecretion of pus as may be noticed the ſecond day after the application of a bliſter; the ſtimulants will now have performed their office, and if continued on they will produce unpleaſant effects themſelves, ſomewhat reſembling the complaint they were meant to cure, although on a different part of the ſyſtem, as by theſe means the external abſorbent veſſels would be the moſt excited, whereas the original accident

appears to have excited the exhalant veſſels more; for which reaſon, as the equilibrium of action will appear nearly to be reſtored, it will now be neceſſary to apply leſs irritating ſubſtances; therefore, inſtead of baſilicon made into a liniment with ſpirit of turpentine, it may be rendered into a proper conſiſtence with camphorated oil. Should even this be too ſtrong, and any appearance of irritation take place, the cerate with lapis calaminaris, or Goulard's cerate, will anſwer every purpoſe, and abate any irritation that may have ariſen from the former applications. What I have found very effectual in ſuch caſes, is an ointment made with the addition of a ſcruple of flowers of zinc to an ounce of the white ointment *(unguentum ceræ albæ)*; this continued until the part heals is in general ſufficient; but if the ſkin ſhould, after healing, remain very tender, and likely to crack, a liniment, formed of lime water and linſeed oil, would be uſeful. I have frequently found much advantage from camphorated oil in this ſtage. Theſe means properly attended to, and keeping the tender ſkin covered from the too great action of the external air, I have found effectual in curing and quickly reſtoring the cuticle to a healthy ſtate, after moſt ſevere caſes."

2dly, *The internal means* are thus enumerated:

"In order to form a judgment of what ought to be the internal means, let us enquire what effects are produced from ſlighter irritations upon ſubjects poſſeſſing different degrees of ſtrength. Suppoſe, for inſtance, a healthy vigorous man receives a ſcald upon his body, of the ſize of the palm of the hand, a conſiderable degree of pain follows, the parts are thrown into a violent action, and, from abſorption and ſecretion being unequal, an effuſion takes place; whatever be the means that are uſed for this accident, the energy of the parts is ſuch as, in a few days, to have run through their different ſtages, and the part gradually re-aſſumes its former healthy functions, without having diſturbed thoſe of the other parts of the body. But had this accident happened to a man of an irritable habit, the conſequences would be very different; the pain would appear to be much greater, at leaſt the patient would ſhew greater ſymptoms of ſuffering; not only the action of the part would be increaſed, but alſo the action of all the ſympathiſing parts of the body, the pulſe would be quickened, and a real ſympathetic fever would take place; probably the part itſelf, inſtead of ſpeedily coming to a ſuppuration, might communicate its diſeaſed action to the contiguous parts, which would aſſume the eryſipelatous inflammation, and require a much greater length of time to run through the different ſtages of the diſeaſe. Now ſuch different effects being produced upon different ſyſtems by exactly the ſame cauſe, would require very different treatment. To the robuſt conſtitution, nothing might appear neceſſary, the *vis medicatrix naturæ* would alone be ſufficient; nay, it might go further,

and reſiſt the raſh attempts of ignorance under the ſpecious pretence of aſſiſtance; but with the nervous, irritable habit, we ſhould be obliged to have recourſe to tonic remedies, or ſubmit to long and tedious cures, which too frequently are the conſequence.

"To what are we to attribute the different appearances in theſe two caſes, both ariſing from the ſame cauſe? Is it not natural to conclude, that the different degrees of ſtrength which they poſſeſſed was the cauſe? What concluſion may we draw from this? Surely, that ſtrength reſiſts the ſympathetic irritative actions of other parts, and that weakneſs induces them. Now if this is admitted, it will follow that in all caſes we ſhould make the ſyſtem as ſtrong as we can, immediately upon the attack; for, according to the degree of ſtrength the ſubject poſſeſſed at the time, ſuch will be the degree of injury. From whence it will follow, that in caſes of great magnitude, where the violence is conſiderable, the ſtrongeſt habit will ſtand in the ſame relative ſtate to this accident, as the weak irritable habit did to the ſmaller, that is, the quantity of violence is ſtronger than the reſiſting powers of the ſyſtem; the weakneſs, therefore, of the ſyſtem is the cauſe of its fall. This weakneſs is no reflection upon the powers of the ſyſtem, for fire is not the element we are organiſed to exiſt in. But the ſubject leads to the inveſtigation of our powers, with reſpect to reſiſting the action of fire, in order that, when we are unfortunately expoſed to its pernicious influence, we may place ourſelves in that poſture of defence which, from experience, we are convinced is the beſt.

"The animal ſyſtem performs a ſeries of actions: different parts have different functions, but the reſult of the whole is unity or health; for if any part is either increaſed or diminiſhed in its proportion to the whole, the other parts ſympathiſe with it. This ſympathy is more ſtrongly marked in ſome diſeaſes than in others; the ſkin and the ſtomach have a particular ſympathy in moſt diſeaſes; and the ſkin in others, which are not of conſequence enough to affect the ſtomach.

"In intermittents we find this ſolution of the continuity of action upon the ſurface excites the ſyſtem to uſe the moſt violent exertions, which throws it into unnatural increaſed actions, in order to reſtore the unity of action; which when done, it gradually ſubſides, and leaves the body in a weakened ſtate, from the too great exertion which the alarm of the ſyſtem had thrown it into. As this exertion is totally involuntary, it may be termed the *vis conſervatrix naturæ*.

"This ſymptom of intermittents ſeems entirely to have depended upon this cauſe; for if the ſyſtem is placed in ſuch a ſituation as to prevent this taking place, the other conſequences will not follow: for inſtance, previous to an ague fit, put the patient into a warm bed, keep him heated with clothes, and excite the internal

ſurface with warm ſtimulating ſubſtances, and that paroxyſm will not take place; that is, prevent the torpor of the part taking place, by keeping up the unity of the action of the whole, and all the ſymptoms will be avoided. Now it appears, from the ſhivering always taking place in burns of any extent, that a ſolution of the continuity of action muſt, if great, produce the ſame effect, whether ariſing from exceſs or defect of action in the part; that is, whenever a ſolution takes place from the torpor of a part, the whole is thrown into inordinate action, to make the part take up the action of the whole; on the contrary, when a ſolution of the continuity of action takes place, from the exceſs of a part, the whole ſyſtem is thrown into a commotion to take on the action of the part. Thus, in both caſes, the natural bias to an equilibrium of action is ſufficiently apparent. Vomiting, which is a common ſymptom previous to the hot fit of an intermittent, and ſeems to proceed from the ſympathy of the external and internal ſurfaces *, ſometimes takes place in burns. In one caſe, where the ſubject was immerſed in caloric, which was in contact with the whole, without any intervening ſubſtance, the ſolution of the continuity of action brought on ſuch ſevere ſhivering, as to cauſe violent ſickneſs, and a bilious vomiting, the ſame as in an ague fit.

"From what has been already ſaid, it will appear obvious, that the intention to be fulfilled ought to be *the reſtoring the unity of action of the whole ſyſtem as ſoon as poſſible*; ſo that thoſe parts which have only had their action increaſed, are, by this re-union, as it were, to the ſyſtem, allowed again to form a part of the whole, and recover as it were by the firſt intention; the more immediately theſe means are uſed the better. The firſt few hours in the treatment of ſuch accidents is of the greateſt moment; as the cauſe was violent and inſtantaneous, the effects will be in ſome degree ſimilar. This mode of relief is only to be continued for a certain length of time, and it requires great attention in the practitioner to be enabled to throw the ſyſtem into ſuch a ſtate as to abſorb the diſeaſed action, and then gradually bring down the whole to the natural ſtandard of action, by nicely diminiſhing the exciting powers, ſo as to aſſiſt, and not offend, the ſyſtem by our interference. After the excitement has been carried as far as may have been thought neceſſary with *æther* and *alcohol* internally, which ought only to be given once or twice, and that within the firſt eight or twelve hours, wine or ale may be allowed the following four-and-twenty hours, and very little on the third day, as the ſecretion of pus will begin to take place, when it will be no longer neceſſary to excite the ſyſtem. I have generally added laudanum to the alcohol, from the general idea of its abating

* By internal ſurfaces is meant all the ſecreting ſurfaces of the body, which Mr. K. believes, have a very conſiderable ſympathy with each other.

pain; whether in this complaint it may be an auxiliary to the other means or not, in the firſt inſtance, I am uncertain, but future experience may enable me to gain that information, either from my own obſervation, or that of ſome of my medical friends, who have promiſed that they will not only give me information on that part, but of every other particular which may occur; and ſome of them have extenſive fields for remark upon the treatment of this ſpecies of accident.

" Secondly, Of thoſe caſes where ſome have their action increaſed, and others their action deſtroyed. The mode of treatment in this claſs I ſhall divide into two parts, namely, the external and internal means."

1ſt, *The external treatment* Mr. K. deſcribes in theſe words:

" Having already mentioned what I found the moſt advantageous in burns with only increaſed action, it will be unneceſſary in this place to repeat what was there ſaid; I ſhall only add, that as I never ſaw a burn where the part was ſo completely deſtroyed as not to leave other parts where the action was only increaſed, I ſhould ſtrongly recommend the uſe of thoſe means which would ſave the then living parts; this is of the firſt conſequence; as for the dead parts, the application which is immediately applied to them is of very little conſequence, for the throwing off theſe eſchars depends upon a proceſs of the ſyſtem, which the immediate application to the dead part will in no way either retard or facilitate; but to place the contiguous parts in a ſtate of health and ſtrength, ſo as to perform their actions with vigour, will certainly facilitate the proceſs, and relieve the ſyſtem from greater efforts, and the patient from a tedious cure.

" The progreſs of thoſe parts which have only been ſlightly injured, will lead us to form a judgment of the ſtate of thoſe which are further injured; for, if the curative indications take place ſoon, and proceed with vigour in the one, we may be aſſured all the other functions are performing their offices duly in the other. As ſoon as the ſkin which has had the cuticle detached from it begins to ſecrete pus, which is ſometimes the caſe upon the ſecond day, the parts adjoining an eſchar begin the ſuppurative proceſs; that is, they tumify, and the abſorbents detach the dead and living parts from each other, while the exhalant or ſecreting veſſels form pus; thus the ſurface is reſtored to its former functions, that of a ſecreting and abſorbing ſurface, and although the parts are not guarded in the manner nature meant, yet, when the natural ſurface of a part is deſtroyed, this *ſecretion* and *abſorption* is neceſſary to the healing proceſs, and the quickneſs or ſlowneſs with which an ulcer heals principally depends upon the management of theſe ſtates. I am now ſpeaking of the moſt favourable caſes; for, though in ſome ſubjects this proceſs may begin in ſixty hours, yet I have ſeen it retarded to the tenth

day, and the patient recover; but, in general, I believe it will be found, that if it does not take place before that period, the eryſipelatous inflammation is communicated by the abſorbents, and the ſecreting veſſels having their action upon the ſurface ſuſpended, the inactive parts become greater and greater, till at laſt the ſyſtem, thrown into *deſpair* as it were, increaſes its action, ſo as to exhauſt its powers; and the whole fabric ſinks, from general debility and local ſymptoms of mortification. The eſchar will begin to detach itſelf around the edges, and, when once the ſkin is ſeparated, the other parts will follow according to their ſpecific nature: if only the adipoſe and cellular membranes are affected, they will ſoon be abſorbed, and leave the wound in a ſituation to granulate. During the proceſs of ſloughing, a cataplaſm of milk and bread, from its ſoftneſs, and as applying a grateful degree of the ſtimulus of heat, is perhaps one of the beſt topical applications at this period; the eſchar may be waſhed with a little camphorated ſpirit, ſo cautiouſly as to avoid touching the living parts, by which means the offenſiveneſs of the wound will be much leſs to the patient and the attendants. Should the proceſs ſtop at any period, touching the part either with camphorated ſpirit, or eſſential oil of turpentine, will be a ſufficient ſtimulus to produce a renewal of action. If the ſecretion of pus round the edges of the wound, from the application of the cataplaſm, ſhould be too great, they ſhould be waſhed with a little tepid Goulard's water, and afterwards well duſted or covered with ſome flowers of zinc. A cataplaſm made with Goulard's water is ſometimes of very great uſe; but if the ſurface was large, or the wound deep, the abſorption of this mineral ſolution is ſometimes attended with danger; nay, I have ſometimes ſeen bad effects from it in an ointment, which has induced me to give the preference to the flowers of zinc, or the *lapis calaminaris*. When the dead parts are come away, the wound muſt be treated in ſuch a manner as to keep as exact a balance between the abſorption and ſecretion as poſſible; ſometimes gently exciting, at others repreſſing, ſo as to allow the ſyſtem to repair itſelf, which all its efforts tend to; but, as much of this depends upon the internal means, we muſt now treat of that."

2dly, *The internal treatment* Mr. Kentiſh deſcribes thus:

"From the opinion which I have already advanced, viz. that I never ſaw ſo complete a deſtruction of a part as not to have left other parts only in a ſtate of greater action, it will be natural to conclude, that the mode of treatment I followed in caſes of increaſed action, will be neceſſary to be purſued until thoſe parts are reſtored to the ſyſtem; I ſhall, therefore, refer the treatment in the firſt inſtance to that head, and ſhall now only add what will be neceſſary, after the unity of action has taken place with all the living parts, to throw off thoſe that are dead, and the after-treatment to facilitate the cure. After the ſyſtem has been excited to

ſuch increaſed action as to take up the action of the diſeaſed part, it will not afterwards be neceſſary to continue it longer, although it muſt not be ſo quickly lowered as if there were no eſchars. When the unity of action is reſtored, the next proceſs will be the commencement of the ſeparative, that is, the edges of the eſchar will tumify, be abſorbed, and pus ſecreted. This proceſs of the ſyſtem requires ſtrength, that is, according to the ſtrength of the ſubject it goes on more or leſs favourably, therefore the internal means muſt be ſuch as give ſtrength, without increaſing action. This is perhaps anſwered by what is called a ſtrong nouriſhing diet, better than by any other means, at the ſame time diminiſhing the fermented liquors. The bark is, by ſome, ſuppoſed to poſſeſs the power of ſtrengthening in a very conſiderable degree; it, therefore, may be given in decoction, or in powder mixed with milk: the latter mode ſeems to have the advantage, as it anſwers partly for food at the ſame time. An anodyne may be given at night, as reſt contributes much to facilitate the proceſs; for all the actions which are involuntary are leſs diſturbed during ſleep than at any other time, conſequently better performed. This ſtrengthening plan ought to be continued until the eſchar has looſened around the edges, when it may be leſſened, by taking leſs animal food, but ſhould not be totally deniſted from until the wound is quite free from the dead parts; when, inſtead of giving much ſtrengthening food to ſupport the diſcharge, he ought to be put upon rather a ſtrict diet than otherwiſe, by which means the diſcharge moderates, the granulations take a firm healthy aſpect, fungus is prevented, and the cure will proceed with ſuch a degree of quickneſs as to aſtoniſh the ſurgeon, ſhould he have been accuſtomed to view the ſlow progreſs from the former methods of treatment."

To the foregoing ingenious obſervations are annexed ſeveral caſes treated by the author; the firſt of theſe we ſhall preſent to the reader as beſt calculated to ſhew an inſtance of the author's remedy in his own hands. Other caſes, from the concluding pages of the work, will at once ſhew the ſucceſs of the plan of treatment deviſed, and the teſtimony of other reſpectable practitioners in its favour.

Case I. "G. H. a pitman, aged about 36, belonging to a coal-work in the neighbourhood, in the month of November, 1792, was expoſed to the action of diſengaged caloric, from the combuſtion of a large quantity of hydrogen gas, which, from the neglect of keeping up the circulation of the atmoſpheric air, had been allowed to collect in a part of the work he had to paſs with one of the ſmall lighted candles they work with, which acting as a combining medium of the oxygen and hydrogen gaſſes, cauſed the exploſion: he had on a flannel ſhirt, drawers, and ſhoes and ſtockings, ſo that the parts expoſed to the contact of the flame were his face, neck,

and part of his breaſt, alſo his hands, and ſome part of the arms: from the whole of the face being much burnt, particularly the lips and the noſtrils, there was as much reaſon to ſuppoſe this man much burnt internally as any I ever ſaw; the hands in ſeveral places appeared deeply burnt, and he had very ſevere ſhivering fits, and all the bad ſymptoms which indicated a very rude ſhock to the ſyſtem. The whole of the burnt parts were liberally waſhed with ſpirit of turpentine, and covered with plaſters ſpread with a liniment compoſed of baſilicon, made very thin with ſpirit of turpentine; he had a cardiac draught, with fifty drops of laudanum, to take inſtantly; a pint of oily emulſion, with an ounce of camphorated tincture of opium, to take a teacupful every three hours; and a bolus at night, with two grains of opium; the diet was ordered to be generous and ſtimulating.

"Second day.—Had ſeveral paroxyſms of pain during the night, and alſo ſome ſhort intervals of repoſe; ſlight veſications appeared in different parts of the neck and face; the ſerum of theſe was diſcharged by puncturing them with the ſharp point of a probe; it was not thought neceſſary to repeat waſhing the parts with the eſſential oil of turpentine, but to uſe ſomething leſs ſtimulating. Tincture of opium was thought of and applied, after which the dreſſings as before; a decoction of the bark, with the proportion of two ounces of the tincture to a pint, was ordered to be taken in the quantity of a teacupful every two hours; the bolus, with opium at night, was repeated, with the addition of five grains of calomel to obviate conſtipation; he continued the diet as at firſt ordered.

"Third day.—Had more ſleep laſt night, and leſs pain than the night before; the redneſs of the neck and breaſt had a good deal diſappeared; where the veſications were, a kind of ſecretion had taken place, ſuch as may be remarked upon the ſecond or third day after the application of a bliſter; ſome of the redneſs had alſo diſappeared about the wriſts, but the hands ſeemed to remain much in the ſtate they were in at firſt; the redneſs was not ſo perceptible as before, and the parts ſecreting had nothing applied to them but the plaſters as before; the parts of the hands which appeared little changed were again waſhed with the tincture of opium, and treated as before; the medicines were continued, except the calomel, which had procured a ſtool.

"Fourth day.—Was not ſo eaſy laſt night as he had been before; pulſe 110; tongue dry with thirſt; the parts which had been red, and ceaſed to appear ſo, were now re-aſſuming that appearance, and the ſecreting ſurface under the veſications was dry; from theſe circumſtances I ſuppoſed that the ſtimulating applications to the abſorbents being continued after they had re-abſorbed the ſecreted fluid, might be the cauſe of this re-appearance of inflammation, accordingly I ceaſed the digeſtive liniment,

with the basilicon and oil of turpentine, and applied plasters spread with *ceratum é lapide calaminari* to the face, neck, and breast; the hands were tumified, but as there had been no appearance of pus upon them, I judged that to be an effort of the system to throw off the eschar; with this view I therefore continued the former dressings to the hands; the same medicines and diet were still ordered.

"Fifth day.—Has passed an easier night; pulse 100; the new inflammation upon the face, neck, and breast, not so violent as before, and a little moisture on the part which had been secreted; the dressings to those parts the same as yesterday; the hands still much tumified; they are dressed as before; continue medicines as before.

"Sixth day.—Continues easier; the face, &c. much better; some parts beginning to skin; the hands remain much swelled, but the skin is beginning to separate, and a degree of moisture to be secreted round the edges of the burnt parts: the same means continued.

"Seventh day.—The upper parts are healing very rapidly, and there is a greater secretion of pus from the hands.

"Eighth day.—Appearances still as favourable; the hands secrete a great quantity of pus, and the eschars are loosening; both external and internal stimulants having brought about the state of the system I wished, that is, a sufficient secretion of pus, it now appeared, from my former experience, to be necessary to desist urging the system any further, therefore the diet was changed in its quality, and the tincture of bark was omitted; one half the quantity of opium was given, and the dressings on the hands were changed for the same cerate as the face.

"From the eighth to the fifteenth the same means were continued with the best effect; the change of diet moderated the discharge, and brought on the disposition for healing in a much better and more rapid manner than I was ever before capable of producing. Notwithstanding the use of every topical astringent, the quantity of pus formerly secreted, and for the length of time, brought on such a state of surface, as resisted every effort of art to heal; and the very means pursued to prevent the patient sinking under the discharge, appears, if not to have been the only, at least the most hurtful, cause of the complaint it was meant to remedy. The face and neck being now skinned, they are anointed once or twice a-day with some camphorated oil, to prevent the cracking of the new skin, which is likewise of much use in taking away that unpleasant redness which [illegible] a long time after the cure. The sloughs upon the hands come away kindly; three of the nails of the left hand have been thrown off, and the sores are healing at the edges.

"From the fifteenth to the thirtieth day nothing particular happened; the ulcers gradually cleaned, and after the formation of granulations, when there was a lois of ſubſtance, they healed kindly; a little fungus now appearing, required to be touched with the common *aqua cærulea*, and in about ten days more the cure was complete, that is to ſay, the whole was covered with a cuticle, but which was yet very tender, and required time and caution, both to give it ſtrength, and to reſtore the motion gradually and ſafely to the flexors and extenſors of the fingers, which, from want of uſe, had acquired a degree of rigidity; by the uſe of camphorated oil, and keeping the parts from the external air by the uſe of gloves, in the courſe of a fortnight more he was perfectly cured."

The following caſes were tranſmitted to Mr. Kentiſh by Mr. Wilkinſon, of Sunderland.

Case II. "On the 15th of December, 1797, a woman, twenty-ſeven years of age, ſubject to fits, was attacked by one of them, in the act of taking from the fire a pan of boiling water, which overturning, ſcalded her face, neck, and breaſt. By falling againſt the hot grate, the palms of her hands were likewiſe burnt. The agony ſhe ſuffered was extreme: her eye-lids cloſed and ſwelled. The whole of the parts injured were liberally bathed with ſp. vini rect. and covered with the liniment, as has been directed, compoſed of ung. reſin. flav. incorporated with the ol. terebinth. The relief obtained by this mode of treatment was truly wonderful: it ſeemed to operate as a charm. As this was the firſt inſtance that occurred in my practice, I could not help feeling a high degree of ſatisfaction at the aſtoniſhing eaſe given by the ſtimulating plan. An anodyne being adminiſtered, ſhe paſſed a tolerably good night. The ſame dreſſings were uſed the day following, and the inflammation ſeemed to be ſubſided. But as this perſon was not my own patient, and I attended only on the account of another gentleman who happened to be out of town, and who, after this time, attended her himſelf, I am unable to particularize the treatment he ſubſequently adopted; whatever it might be, I found, on enquiry, that ſhe recovered very rapidly. The gentleman acknowledged the fact, but deemed the quantity of ſp. vini rect. which was got from his ſhop on this occaſion, and amounted to above a pint, highly extravagant. He ſaid he had lately uſed vinegar, and was an advocate for Mr. Cleghorn's plan, which he had ſucceſsfully adopted in ſeveral caſes. I had done the ſame; but from the great ſuperiority of this new mode of treatment, in the quickneſs of the cure, and the ſudden ceſſation of pain, I determined to perſevere in the ſame treatment in future.

Case III. "Elizabeth Fraſer, an infant, aged three years and a half, on the forenoon of the 5th of January, 1798, ſitting on the floor, and having no other covering but a light outer garment, was

terribly ſcalded by a large iron pot full of boiling water ſlipping ſuddenly from the fire. On my arrival very ſpeedily afterwards, I found that the poſterior part of her thighs, buttocks (particularly the right), part of the left leg to a conſiderable extent, the exterior part of the right leg, near the ancle, the right groin, and *mons veneris*, were the parts on which the injury was principally inflicted. Theſe being well bathed with the ol. terebinth. and covered with cloths ſpread with the ointment deſcribed in the former caſe, the child received relief almoſt inſtantaneouſly. This was experienced during the bathing of the parts, for on my entering the room her cries were piercing; but by the time ſhe was dreſſed, which took up about twenty-five minutes, or little more, they had ſubſided to ſobs. Being put to bed, a gentle anodyne was adminiſtered, and ſhe very ſoon fell aſleep, and paſſed a tolerably eaſy night.

"The day following ſhe was again bathed with the ol. terebinth. and the ſame liniment was applied. The poſterior parts, ſuch as the buttocks and thighs, from preſſure by lying on her back, were abraded of their cuticle, part of which came away with the dreſſings. The anterior veſications on the belly, and other parts taken notice of, which were entire, were now punctured.

"The third day, January 7th, ſuppuration had begun to take place upon thoſe parts from which the cuticula had ſeparated: theſe were dreſſed with the ung. e lapide calamin. The parts on which the ſkin had remained, after being punctured, were ſtill dreſſed with the liniment.

"Fourth day, January 8th, the whole were dreſſed with the cerate, which was continued throughout the courſe of the cure, which took up juſt ſixteen days, thoſe parts on which the cuticle remained being healed up by far the ſooneſt. The anodyne was adminiſtered for about three nights only, it being no longer neceſſary. Three doſes of calomel (pulv. cathartic.) were given at intervals towards the latter end of the cure; and, ſtrange to ſay, this child, although very delicate and puny, from being previouſly affected with the hooping cough, recovered moſt ſurpriſingly, and that to the aſtoniſhment of all the ſpectators who ſaw her, many of whom ſcrupled not to declare, that they had known accidents of far leſs conſequence, oppoſitely treated, take up more than double the time occupied in this inſtance.

Case IV. "Another infant, Elizabeth Catty, aged only ſeventeen months, was, on the 21ſt of September, 1798, by a ſimilar accident, ſcalded ſhockingly. The injury extended from above the left knee down the whole external ſurface of the leg and ancle, and on the right arm from the top of the deltoid muſcle to the articulation of the joint of the elbow, ſpreading to the fingers down the exterior ſurface of the arm, and alſo the greateſt part of the right cheek. The ſcreaming of this little creature on my entering the room, which was almoſt immediately after the acci-

dent, was lamentable, and she was shivering as if in the fit of an ague, a circumstance I ought to have noticed in the two former cases. The ol. terebinth. was applied liberally with a feather: I could plainly perceive, during the process, that the pain gradually diminished, so that by the time she was dressed with the liniment. ex ol. terebinth. ung. resin. flav. which took up more than half an hour, she had nearly ceased crying. As I had heretofore given an anodyne after the first dressing on former occasions, I omitted it in this case, with a view of ascertaining the full effects of the application in appeasing the pain. An hour after this I saw her again; she appeared quite easy, and soon after slept, but was disturbed at intervals by the recurrence of pain, which was always mitigated by moistening the dressings, as they became dry, with a feather dipt in ol. terebinth.

"On the 22d, the appearances of the parts were very promising (although she had now and then been disturbed in the night), and the inflammation was pretty much abated, particularly on the face, right arm and hand, and part of the left leg. The deltoid muscle, elbow joint, part of the arm, and below the knee, were covered by large and extensive vesications, which were carefully punctured, and the dressings again applied as before.

"The 23d, some portion of the cuticle came away with the dressings about the elbow, and a little below the knee, these parts having just begun to take on the suppurative process; they were, however, once more dressed with the stimulating applications.

"The 24th, a plentiful discharge appearing, the whole of the parts were dressed with the cerat. e lap. calam. The swelling of the face in particular, and indeed of the whole, had subsided, the former being about to heal, as the cuticle was now beginning to peel off dry. But those surfaces abraded of their cuticle, that had suffered the most from the hot water being longer in contact, seemed to feel much on their exposure to the atmospheric air, a circumstance that almost invariably takes place, particularly in cold and frosty weather. Hence arises the absolute necessity (which I wish strongly to inculcate) of humanely lessening the miseries of these unfortunate objects, by always having the new dressings ready, prior to the removal of the old ones.

"The 25th, the discharge was by no means diminished, but as she had appeared peevish and restless for the last two nights, a small quantity of an anodyne julep was directed to be taken at bed-time, more especially as she was about her teeth, and was affected with a moderate looseness. From this time the sores began to heal rapidly, and the whole cure was completed in about sixteen or seventeen days. A gentle purge or two were exhibited towards the latter end, to obviate the costiveness caused by the anodyne. The tenderness and disposition of the skin to fret and crack, which often take place after the cuticle is first formed, was relieved by

the application of the liniment. ex aq. calcis c. ol. lini, which alſo prevented the contraction of the muſcles ſurrounding the joint.

" A brother of this child, about ſix years of age, was hurt by the ſame accident: his left foot was much ſcalded, from above the ancle exteriorly to the heel, and the injury included nearly half the foot; the boiling water had, undoubtedly, been in contact with it for a long time, as a large veſication, about the ſize of a duck's egg, occupied the foot. I did not puncture it for three or four days, when fearing it might be broken accidentally, and the cuticle thereby be torn off, I was induced to do it. He was treated exactly in the ſame way as his ſiſter, and obtained eaſe from the ſame applications; but his cure (I mean the healing of the ſore) took up nearly a month.

Case V. " John Reed, aged thirteen years, apprentice to Capt. David Hughes, of the ſhip Elizabeth, of Sunderland, while ſetting fire to a compoſition of gunpowder in the ſtreet, on the night of the 15th January, 1799, a ſpark of fire came in contact with ſome gunpowder he had imprudently put looſe in his waiſtcoat pocket, and he was thrown by the exploſion to a conſiderable diſtance acroſs the ſtreet, its violence being ſuch as to raiſe him ſome height from the ground. He was immediately taken to the diſpenſary, which was near to the place where the accident happened. All the injured parts were anointed with the liniment ex aq. calcis, et ol. lini, before I ſaw him. On my arrival, I found him ſhivering, as if in the cold fit of an ague, his teeth chattering, and he complained of great pain and intolerable heat over his body, not being in the leaſt relieved by the applications which had been uſed. I removed the dreſſings, which I diſcovered to be the cerat. e lap. calam. put over the liniment. I loſt no time in applying the ol. terebinth. made warm by placing it in a ſmall baſon, ſurrounded with hot water, while my aſſiſtant was ſpreading the cloths with the liniment uſed on former occaſions. The extent of the injury was very conſiderable in this patient; the belly, above the *umbilicus*, and the right ſide of that region, with a conſiderable portion of the left, and ſome parts below it, were much ſcorched; a large portion of the ſkin of the right pectoral muſcle, the top of the right ſhoulder, nearly the whole of the face, but particularly the lips, the inſide of the mouth, noſtrils, and a part of the breaſt and left ſhoulder, a large portion under the right axilla, which was diſcovered on the enſuing day after dreſſing him, as alſo a ſmall part near the falſe ribs, poſteriorly, were much burnt. An anodyne cordial draught, containing about thirty drops of tinct. opii was exhibited, and he paſſed as good a night as could be expected, his ſleep being diſturbed by ſome paroxyſms of pain.

" The enſuing day, on dreſſing the parts, the injury they had ſuffered was diſcovered, to the extent already mentioned; the eyes and eye-lids fortunately, however, had eſcaped being hurt. Inno-

merable ſmall particles of the gunpowder were found ſticking every-where, particularly about the belly, breaſt, face, &c. ſurrounding as it were the eſchars, which, in many places, were deeply ſeated, and extenſive. The face, being leſs injured, was now anointed with the liniment. ex aq. calcis et ol. amygd. and a ſmall portion of camphor; the reſt of the parts were dreſſed as at firſt. A ſaline mixt. c. conf. card. was exhibited, and the anodyne was repeated at bed-time; his pulſe was at 115, and he complained of thirſt.

"On the 17th, he was eaſier than on the day before, the appearances of the parts in general were favourable, particularly the face; the pulſe ſtill continued at nearly the ſame ſtandard.

"On the 18th, he was much the ſame as the day before; ſome parts had put on the appearance of ſuppuration around their edges: theſe were dreſſed with the cerat. e. lap. calam. and thoſe on which it had not taken place, had the former dreſſings applied. The medicines as yeſterday were continued, and the patient being coſtive, an enema was injected, which, with the aſſiſtance of two or three grains of calomel, procured ſome motions; his pulſe was reduced to 90; the anodyne was continued at bed-time.

"On the 19th, he felt much eaſier, having paſſed a very good night. Some more of the eſchars on the belly, breaſt, and ſhoulders, appeared to looſen; thoſe under the axilla felt very troubleſome; the face, noſtrils, lips, and mouth, appeared to mend rapidly. The diſcharge in this patient, which had begun to take place, ſmelt very ſtrong, and conſiderably fetid, much more ſo than in any of the former caſes deſcribed.

"On the 20th (ſixth day), the ſtimulating plan was gradually withdrawn, both with reſpect to external applications and diet, the former being now changed entirely to the cerat. e lap. calam. From this period to the twelfth day, the amendment became viſibly progreſſive. The face (as I have invariably obſerved in almoſt all caſes of this ſort, although in this it was by no means ſo much injured as other parts) was the firſt that healed. This, with great part of the breaſt and ſhoulders, had taken on the ſkinning proceſs. The eſchars, which were deeply ſeated on each ſide of the umbilical region, as alſo that near the axilla, did not ſeparate completely till about the eighth or ninth day. The ſurfaces of the tender ſores, previouſly to the application of the cerate, were well duſted through the perforations of a tin box with pulv. e creta pp. et pulv. amyli, in the proportion of four parts of the former to one of the latter. This method I had adopted on a former occaſion of a moſt alarming and dangerous nature (which will be the ſubject of the following caſe), with uncommon ſucceſs. The gleety troubleſome diſcharge which always takes place in deſperate and deeply-ſeated injuries of this ſort, and alſo the pain and irritability, were by theſe means much leſſened, and the cure rapidly advanced, which in

this severe case was effected in about thirty days; and what is also pleasing, no unseemly scars ensued, a circumstance that has scarcely ever failed to happen in such cases under the old treatment. His bowels were kept open during the cure by clysters, and he was occasionally purged with calomel et pulv. cathar. towards the end of the time. He kept his bed for the first ten or twelve days, after that time he sat up in the day-time, and on the twentieth day went out of the house, coming afterwards every day to be dressed at my house.

Case VI. "On the 6th of November, 1798, Mrs. E. Foreside, aged fifty-six, lately resident in Sunderland, but now living at No. 20, John's-street, Surrey-road, Blackfriars, while reading, about eight o'clock at night, is supposed to have approached too near the candle, being alone at the time, and was found sitting upright in a blaze on the floor, while the candle lay burning by her, the flame of which had not only penetrated through a thick oil-cloth, but had actually communicated to the boards. How long she had continued in this situation cannot well be ascertained; but when the woman with whom she lodged found her in the position above described, she was burning, and in a state of stupefaction. On my entering the room she scarcely uttered a syllable, and appeared to feel but little all the time I was dressing her, which, from the nature and extent of the injury, must have taken up a considerable extent of time*. The parts exposed to the contact of the fire were considerable; they extended from under the right ear a little towards the shoulder, and in the direction of the mastoidœus muscle, including the clavicula from its articulation with the arm to the sternum, and nearly the whole of the pectoral muscle, advancing towards the axilla. Below this, it was separated by a small space, and covered the superior and anterior portions of the right mamma, just above the nipple. The burn in this part was nearly three inches across, and two and a half from above downwards. In the centre of the sternum, immediately below the insertion of the sterno-mastoidœus muscle, appeared a space above an inch and a half in breadth, and more than an inch from its superior to its inferior termination, and again beneath another space presented itself, of a size somewhat less. The greatest part of the right shoulder blade, extending crossways three and a half inches, and more than two and a half from above downwards, appeared to be most dreadfully affected, and the injury very deeply seated. From the top of the left shoulder, beginning immediately

* The shivering or rigor usually attendant on accidents of this sort, and which is more or less vehement, according to the degree of danger, extent, or violence of the injury inflicted, was in this instance absent. How far this is to be imputed to the effects of terror operating powerfully upon the nervous system, and thereby depressing the vital energy, I shall not take upon me to determine.

below the glenoid cavity of the ſcapula, a ſpace covered the whole of th deltoid muſcle, from above downwards, and extended a little forward to the left pectoral muſcle, and ſomewhat backward to the ſame ſhoulder. Immediately above the left eye-brow a large eſchar appeared, in ſize an inch and a half acroſs, and an inch from below upwards. But the worſt of all was the crown of her head, which was ſcorched moſt terribly. The fore part being defended by a cuſhion, over which her hair had been laid, was preſerved from injury. The breadth of this eſchar was three and a half inches, and its length, extending acroſs the head, ſomewhat leſs than five inches. The cuticula on this part ſeemed quite deſtroyed, and no appearance of veſication preſented itſelf. The whole of the cutis in general was dreadfully ſcorched; that on the fore parts of the body, from the ear, clavicula, breaſt, &c. appeared of a dirty white, or aſh colour, interſperſed with ſome ſtreaks of a reddiſh hue; that on the left arm and right ſhoulder blade was hard, dry, and contracted, of a dark brown colour, and that on the top of the head almoſt black. She was dreſſed with the ol. terebinth. and the liniment was applied as uſual over the whole ſurface of the parts injured, and an anodyne, with thirty drops of tinct. opii, was immediately given. The diet was directed to be rich and nouriſhing.

" Nov. 7.—She had paſſed but an indifferent night, had ſome ſmall intervals of repoſe, but at times appeared uneaſy. She had come more to herſelf, but appeared much dejected, and ſpoke but little. The appearances of the parts much the ſame as yeſterday; her pulſe 114. She was ordered a ſaline cordial mixture, and the anodyne was again repeated at bed-time. She was allowed rich negus, and whatever kind of food ſhe pleaſed. The eye-lid being tumified, from an idea of the ol. terebinth. being improper, I ordered a ſolution of the ceruſſa acetata to be applied conſtantly to it.

" Nov. 8.—The appearances of the injury much the ſame; the medicines and diet were continued, pulſe the ſame as the day before.

" Nov. 9.—She ſeemed much the ſame, excepting that ſhe felt her eye-lid very ſore, and ſaid it had given her more pain and uneaſineſs than any other part. At this time a diſagreeable vapour ſeemed to ariſe on taking off the dreſſings, which began to exhibit ſome moiſture.

" Nov. 10.—The neck, pectoral muſcle, and ſome parts of the breaſt, appeared moiſt around their edges; the eſchars on theſe parts had begun to ſeparate, but no alteration appeared on the left arm, right ſhoulder blade, or top of the head, which were hard, dry, and contracted. The ſame dreſſings were ſtill continued as at firſt, as was the anodyne at bed-time, and a few grains of calo-

mel c. pulv. cath. to procure a motion, which ſhe now wanted, were given. Her pulſe had fallen to 100.

" Nov. 11.---The diſcharge from the parts which were above mentioned to be in a ſuppurative ſtate, was now conſiderable, and ſmelt moſt remarkably fetid, ſo as to be quite diſtreſſing and inſupportable to the patient, and even to myſelf. Some ſloughs had come away from the ſternum, and part of the right clavicle; the eſchar above the eye-brow had begun to ſeparate, but ſhe complained much of it. It was dreſſed with the cerat. e lapid. calam. as were thoſe other parts which had ſeparated their ſloughs.

" Nov. 12.---From this period to the 20th nearly the whole of the eſchars had gradually ſloughed away; the diſcharge continued to be very profuſe, and had ſomewhat abated of its fetor: the patient appeared much dejected, nervous, and irritable, although ſhe was eaſier with reſpect to pain; and, when I purpoſely omitted the anodyne, ſhe felt worſe for want of it. She took decoct. cort. cum conf. card. with evident advantage. The large and extenſive ſloughs on the left ſhoulder, right ſhoulder blade, and top of the head, had not been caſt off; all of theſe, however, diſcharged freely; the two latter, viz. the top of the head and ſhoulder blade, being remarkably deep ſeated, I was induced to continue for a much longer time the ſtimulating applications and digeſtive to them. I was extremely apprehenſive that the pericranium had been injured, and ſo far was I from being in haſte for the removal of this ſlough, and that on the ſhoulder blade, that I ſuffered them to be completely detached before they were taken away. That on the head was not removed till about the twenty-firſt day from the accident, and that on the ſhoulder blade ſome days later. I ſtate theſe particulars, becauſe I generally perceived that the outer edges on which the operation took place had even begun ſlowly to aſſume the healing proceſs, prior to their complete ſeparation. In the interim the raw ſurfaces of the ſores were well duſted with pulv. e creta. pp. ſubtil. levigat. prior to the application of the dreſſings, the parts being previouſly waſhed and cleaned round their edges with a ſoft ſponge. The weather being froſty, my patient felt very uneaſy from the atmoſpheric air, always having much pain on its acceſs. The creta appeared to anſwer the purpoſe of a complete defence, and occaſioned the dreſſing to be much leſs painful. The firſt two or three days that the creta had been uſed, my patient felt herſelf diſordered in her whole ſyſtem; no irregularity had been previouſly committed in her diet, neither were her bowels lax, or coſtive, nor were the ſores more painful; but ſhe was about this time ſeized with gripes, and a profuſe diarrhœa, although the anodyne was ſtill continued at bed-time. At other periods prior to this ſhe had uſually been coſtive, and it was found neceſſary to keep her open with gentle purges. An idea then occurred to me, that it might proceed from ſome chemical combination that had

taken place from the creta applied so freely. It was then that I thought of combining it with the pulv. amyli, as mentioned in John Reed's case, and I have since applied it to the denuded surfaces in that form. By the use of the julep. e creta c. conf. card. et decoct. cort. angust. together with a decoction of rice, in which a small portion of radix tormentillæ et cort. cinnam. were boiled pro potu commune, she revived apace. The cicatrization advanced pretty rapidly on the sternum, pectoral muscle, and clavicula. Various islands seemed as it were to arise, which became continents, and were followed by a succession of smaller islands as the skin covered the sores, in a variety of directions. The misery this poor creature suffered was extreme. The podex, by continual pressure, became painful and sore (as she was unable to lie on either side, but was propped by soft pillows); it was defended by adhesive plasters of the ung. litharg. The anodynes were continued, with some intermissions, to the 14th December, and then left off. Her appetite was various, sometimes failing very much, but was usually restored by the cort. angust. which I tried alternately with the cinchona, but always found the former agree much better. Absorbents, such as magnesia, given with conf. card. et aq. menth. cum kali pp. produced great benefit when she appeared uneasy at her stomach, which was sometimes the case, and never failed to remove the acidity which prevailed at times. Notwithstanding the unpromising appearance of the deep and large surface that covered the right shoulder blade, it healed pretty fast after the separation of the eschar, which appeared the most deeply seated, and much sooner than the crown of the head, or that on the part of the arm covering the deltoid muscle, this last being less pressed upon, as she inclined most to rest on the left side. The right shoulder blade seemed to benefit from the warmth and pressure that took place. While the skinning process was going on, which, in such extensive sores as existed in this subject, is a work of slow progress, my patient became often peevish and remarkably ill tempered. Having been indulged to live freely from the first, she was not easily restrained to a more abstemious diet; hence the discharges were profuse, and frequently acrimonious, fretting and irritating the parts with which they came in contact. It was in this state of the case that the absorbent powder already described was of most singular benefit, not only in absorbing the moisture, but defending the tender parts already cicatrized, and moreover relieving the intolerable itching which arose. Paroxysms of fever now and then intervening towards the evening, and her pulse being full and increased, she was purged with calomel et pulv. cath. in the form of a bolus; and when this proved not quite sufficient, as sometimes happened, she took at bed-time (the opiate being omitted) pil. ex colocynth. c. calomel. The benefit she experienced from this treatment was visible, and the troublesome discharge

became leſs and leſs. The period of time taken up in healing the anterior parts injured was about ten weeks; but the right ſhoulder blade, the left arm, and the top of the head, were ſo much injured, that their cure took up about ſix months. The head and left ſhoulder, after being cicatrized, repeatedly became inflamed, and broke out afreſh from the ſcratches cauſed by the itching. The hair beginning to grow, notwithſtanding the head was often carefully and cloſe ſhaved, it of courſe remained tender for ſome time after.

"Occaſionally the granulations, which aroſe above the ſurface, were touched by an armed probe dipped in a ſolution of the cuprum vitriol. ceruſſa acetat. et zinc. vitriolat. made of ſuch a ſtrength as not to give great pain; and the cracked parts already ſkinned were anointed with ol. amygd. c. camph. et aq. calcis. The patient is now alive, in an excellent ſtate of health, and from the few ſeams which now remain (and which are hardly deſerving of the name), it will ſcarcely be credited that her ſufferings were equal to what I have deſcribed."

It ſeems that Mr. Kentiſh was conſulted in this caſe about the twelfth day, and that he adviſed the application of the chalk, which was found of great uſe. Mr. Wilkinſon afterwards added ſtarch powder to the chalk, with a very good effect.

By the following caſe Mr. Wilkinſon meant to contraſt *the conſequences of the different methods of treatment*; it ſeems ſtrongly to indicate the ſuperiority of the ſtimulant mode.

Case VII. "On the night of the 14th December, 1788, a child of my ſiſter's, aged ſeventeen months, and at that time in perfect health, unfortunately fell backward into a large iron pot, which contained a quantity of hot water, and had juſt been removed from the fire. At that time ſhe had on a looſe garment above her ſhift. She was inſtantly taken out, and the whole of her dreſs removed. On my arrival about half an hour after, I found her ſhivering in a moſt violent manner, as if in an ague fit, while by her ſhrieks and cries ſhe appeared to be in great agony. The parts injured were about three inches in breadth, ſituated between her ſhoulders, juſt below her neck, a part of each ſhoulder was alſo included, and the burn extended, ſomewhat leſs in breadth, down the courſe of the ſpine to her loins. In pulling off her clothes nearly the whole of the cuticula was torn off, except ſome ſmall veſicles on the exterior parts of the ſhoulders. Soft cloths well ſoaked in the aq. ſaturnina (Goulard's) were applied, and continually repeated, as cold as could be made, at intervals during the night, and an anodyne was exhibited.

"Second day.---The ſame applications were continued; ſhe had paſſed a very troubleſome night, being often diſturbed by paroxyſms of pain; the anodyne was repeated, and ſhe was kept

as cool as poſſible. Her diet conſiſted of ſago and panada, given cold, and a mixture was given with nitre, &c. to obviate inflammation, and keep down the fever.

" Third day.---The cloths adhering to the ſores, which appeared dry, and of a darkiſh red hue, without any moiſture, they were dreſſed with the cerat. e lap. calam. and cloths dipped in the aq. ſaturn. applied over the whole as cold as poſſible. The parts now appeared tumified and inflamed.

" Fourth and fifth days.---The ſwelling ſtill continued, without any appearance of ſecretion on the ſurfaces. The poor creature felt moſt ſenſibly on taking off the dreſſings, ſhivering at every application, as they were ſtill applied cold, and the cold waſh ſtill repeated. The terror this ſenſible little creature expreſſed every time ſhe was to be dreſſed, and which never will be effaced from my mind, formed the ſtrongeſt contraſt to the ſenſations of E. Frazer and E. Catty, the other children, whoſe caſes I have already mentioned; they expreſſing a ſort of pleaſure, and ſcarcely ever uttering a whimper, or appearing to dread me, except while taking off the dreſſings. At this time the pulſe felt very quick, and being coſtive, a grain or two of calomel was given to open the bowels.

" Sixth and ſeventh days.---No appearance of the eſchars ſeparating, nor had any moiſture or diſcharge proceeded from the ſmaller veſicles, which had ſubſided, except what might be occaſioned by the dreſſings, which were the ſame as before. The pulſe continued quick, and ſomewhat irregular; and a conſiderable degree of irritability ſeemed to pervade the whole ſyſtem.

" From this period to the ninth day, ſhe appeared much ſunk, weak, and even comatoſe. The appearances of the ſores were very unpromiſing, and there were no ſigns of pus, or ſeparation of the ſloughs. She had been allowed wine, or any thing nouriſhing, and took ſome decoct. cort. peru. to all of which ſhe now ſeemed quite averſe. Her pulſe, after this, was extremely low, tremulous, and irregular; ſhe took very little ſupport, and all medicine was diſcontinued as inefficacious. Deglutition was impeded by a convulſive hiccup; the tumefaction of the parts entirely ſubſided, and the inflammation ſeemed to be quite gone. The eſchars were of a brown colour, and emitted a fetid vapour, indicating putrefaction. She continued in a ſtate of ſtupor till the eleventh day, when ſhe was happily releaſed from her miſerable exiſtence."

Mr. Kentiſh here beſtows ſome ludicrous, and by no means unmerited, criticiſms on the chapter on burns, in Dr. Underwood's treatiſe on the diſeaſes of children. The beſt remedy, according to the doctor's opinion, is a *liquid ſoap*, made with ſix ounces of oil, ten ounces of water, and two drachms of aqua kali. " Could a perſon, ſcalded all over," ſays he, " be inſtantly *put up*

to the chin in a cold bath of this kind, and the *head* at the ſame time be frequently *immerged*, or well waſhed with the liquor, I believe very little injury would enſue."

Mr. Kentiſh publiſhes the following caſe from Mr. Horn of Newcaſtle.

Case VIII. "George Smith, an under-viewer, in Ravenſworth colliery, was ſeverely burnt on the 3d July, 1800, by a quantity of inflammable air taking fire in the pit, into which he had juſt deſcended to give directions to the workmen. The exploſion was ſo violent as to drive up ſtones, &c. to the top of the ſhaft (above ſixty fathoms); and the ſhock was felt, and the report which accompanied it was diſtinctly heard, by ſome farmers who were in bed in their houſes, at ſome diſtance from the place.

"I found him two hours after the accident, with his hair ſinged cloſe to his head. The whole cuticle was peeled off from his face and neck, which were quite black with the fine coal duſt, which had been driven ſo forcibly upon them. He was burnt in different places about his loins, and from the knees to the ancles, except ſome ſmall patches where the ſkin had only been ſcorched.

"On looking at his hands I was ſhocked with their appearance: on taking hold of them, the ſkin and nails came off exactly like a torn glove, and the extenſor tendons of the fingers were bare in ſeveral places: in ſhort, he was the moſt ſeverely burnt of any patient who ever came under my care.

"Nothing had been done to him before I ſaw him, as he had only juſt been brought home. He had frequent ſhiverings, and, although a very reſolute man, complained much of pain, and thought he muſt have been injured in his lungs, from the ſenſe of heat he felt there, and from the bad taſte in his mouth.

"There was ſome ſtrong gin and water on the table when I went in, and I immediately gave him a large tumbler-glaſsful of it. I warmed ſome oil of turpentine, by holding a cup of it in boiling water, and I directed the attendants to bathe him aſſiduouſly with it, by means of probes armed with lint, and dipped into the ſpirit. This was continually done while I was employed in ſpreading plaſters (viz. ung. reſin. flav. c. ol. terebinth.), and the poor man found much relief from it. He, however, complained much of his hands, which were very painful, and ſmarted at the time of the application, but ſoon had a much eaſier feel. I applied the plaſters to every part where I ſuſpected the fire to have reached, gave him another glaſs of ſtrong gin and water, to which I added ſixty drops of laudanum, and I deſired he ſhould have more of the ſpirit if the ſhiverings ſhould recur.

"In the evening I found him tolerably eaſy, and, conſidering his ſituation, wonderfully ſo.—He had been my patient fourteen years ago, when he had been pretty much burnt, although not near ſo ſeverely as at this time; and had then been treated with

ol. lin. c. aqua calcis, to which a portion of the tinct. opii had been added, and he remarked, "*that the fire, he thought, seemed likely to be killed sooner now than before.*" He had taken gin-and water only once since morning, when he had a return of the shivering, and his attendants had moistened the plaster with ol. terebinth. at his own request, from the relief he thought he felt from it. I gave him sixty drops of laudanum in a little spirit and water, to be taken at bed-time.

"In the morning I found he had passed a tolerable night; I removed the plasters, and found some slight appearances of suppuration, particularly on the face, where a lardaceous appearance had taken place, but of a black colour from the coal-dust. I bathed the burnt parts again with the ol. terebinth, renewed the dressings, and allowed him gin and water, to be taken when shivering (which now and then threatened him) should occur. At night he took sixty drops of laudanum; his bowels kept open, and he made no complaint of pain except in his hands.

"Third day.—There is a tolerable suppuration on the face, neck, body, and legs. The blackness, from the coal-dust which appears to be firmly attached to the cutis, is separating fast, in the form of black lard. He remarks, *that the fire is killed every-where but in his hands.* He was dressed with ung. resin. flav. with a less proportion of ol. terebinth. He is forbid the use of spirits, but allowed porter as far as three pints in the twenty-four hours, if he chooses so much. His anodyne is continued.

"Fourth day.—The suppuration in the face, body, and legs, goes on well, and several parts are now turning florid, as the blackness disappears. The scorched parts have neither blistered nor run into suppuration. There is a large discharge of thin ichor from the hands; and on some parts of the fingers there is still a thick gelatinous matter adhering. His allowance of porter is continued. He has no shiverings. Dressings are changed for cerat. e lapid. calamin. Anodyne continued.

"Fifth to the eighth day.—Going on well;—treatment continued;—bowels open;—allowance of porter diminished to a pint and a half per day.

"Ninth day.—Suppuration large;—all the blackness gone off;—discharge from the hands still thin, and in great quantity, attended with much pain. Prepared chalk, finely powdered, is ordered to be sprinkled on all the sores, covering it with cerat. e lap. calamin. spread on rags. He is to take five grains of calomel at night, and to have a purge in the morning.

"In the afternoon I was suddenly sent for to him:—The pain in his hands was intolerable, and he had two smart shivering fits. Having never before seen chalk applied, I attributed the pain to its use, but on taking off the dressings, I found my assistant had not applied any of it to the hands. He had used it liberally to

the face, neck, body, and legs, and theſe parts were *perfectly eaſy*. I ordered emollient poultices to be applied to the hands and arms, and renewed every eight hours. The chalk was continued to the other parts.

" Tenth and eleventh days.—The treatment continued. Pus on the face, neck, and legs, of good conſiſtence, and no pain in theſe parts. The hands are eaſier after the poultices are firſt applied, but ſoon become ſo painful as to make him urgent for a renewal of them; and when they are taken off, the diſcharge of thin matter pours from them. Finding the chalk agree ſo well with the other parts, I ſprinkled his right hand freely with it, and covered it with the cerate plaſters. He felt, as he ſaid, a little tingling from the application, and wiſhed to have the poultice continued to the left hand. I was glad of the opportunity of making this comparative trial, and allowed it to be ſo.

" Twelfth day.—Head, neck, and legs, much better;—loins nearly healed. I ſpeak within bounds, when I ſay four ſquare inches of ſkin have been beautifully formed on one leg ſince yeſterday. I know no term which will give ſo good an idea of this proceſs as *icing over;* the extent covered, and the ſmooth ſhiny appearance being ſo like an icy pellicle formed on a ſmooth piece of water.

" Fifteenth day.—Face and legs mending faſt;—loins well;—his hands completely raw, and bleeding from every point;—the poultice on the left hand is deluged in thin matter, and this hand is by far the moſt painful. The right hand covered with the chalk, although painful, is not nearly ſo much ſo as the left, and the man is anxious to have the chalk applied to it, which is allowed;—anodyne continued;—five grains of calomel at night, and a ſmart purge to be taken early in the morning.

" Sixteenth day.—Has had two copious evacuations from the calomel and purging powder;—every part better;—the left hand much eaſier, but the granulations much looſer than the right; they bleed more readily, and are more painful.

" Seventeenth day.—One leg quite ſkinned over; face and other leg much better.

" Twenty-firſt day.—The face and neck quite ſkinned over, except a ſmall part of each eye-lid, and the noſe;—right leg almoſt healed;—right hand ſkinned over from above the wriſt to the ends of the fingers on the inſide, and much better on the back part;—left hand, to which the poultice had been ſo long applied, begins to grow better, but it is far behind the other, ſo as to give a moſt decided preference to the chalk. He is now ſo well that I have allowed him to go into his garden."

Mr. Horne here diſcontinues his journal; and adds, that he has been thus particular in the recital of the treatment, becauſe, perhaps few caſes furniſh ſo fair an opportunity of comparing the new method with others commonly uſed.

Mr. Kentiſh concludes with the opinion of Mr. Nelſon, of Cheſter-le-ſtreet, in the county of Durham, who it appears has had very extenſive practice in caſes of this deſcription, in the collieries on the river Wear. Mr. Nelſon ſays, " when the ſores have taken upon themſelves the ulcerous diſpoſition, nothing but *repeated purging* at due intervals hath ſucceeded in enabling him to finiſh the cure."

The following obſervations from Mr. Kentiſh's ſecond eſſay, ſeem to be neceſſary to the accompliſhment of our wiſh to give the reader a complete view of that gentleman's plan of cure.

" In my former eſſay," ſays he, " I was conſiderably at a loſs in recommending an adequate power to repreſs the growth of fungus, and to abſorb the redundant ſecretion. In the caſe E. F. (page 93 of the former eſſay), which was more than a year under the treatment to the cure, various aſtringent and abſorbent means were uſed, all of which were inadequate to produce a permanent good effect, and required frequent changes to complete the formation of tender and unſeemly cicatrices. In the appendix I mentioned *chalk* as recommended by Mr. Cleghorn. In my firſt trials upon ulcers I did not find this anſwer my expectations, as I thought it irritated the ſurface and increaſed the ſecretion of pus; but having ſince had it prepared under my own eye, as directed in Lewis's Diſpenſatory, and afterwards finely levigated, I am induced, from conſiderable experience, to *change* my opinion with reſpect to its powers; and here I freely offer the tribute of thanks due to Mr. Cleghorn for recommending it. As ſoon as ſecretion takes place, I begin the uſe of powdered chalk, heated to the temperature of the body, which is plentifully applied to the whole ſecreting ſurface, and afterwards covered with a plaſter of cerate. In caſes of eſchars coming away, or while they are detaching themſelves, I fill up the hollow made by their loſs when ſeparated, and fill up their furrow at their edges when looſening, with powdered chalk, covered with the plaſter; and if the proceſs be tedious, a poultice of bread and milk is applied over the plaſter. In very ſevere and extenſive accidents of this kind, I have uſed this method throughout the whole cure after the formation of pus, and have in *general* found it prevent the neceſſity of either aſtringent or cauſtic applications: nor, on the other hand, have I found it retard the cure, by repreſſing the neceſſary ſecretion.

" I cannot attribute the ſucceſs I have met with wholly to the application of external means; the *treatment of the general ſyſtem* bears a very great ſhare, in my opinion; and that treatment is as extraordinary, and as contradictory to the old methods, as any other part of the practice. In my former eſſay, in the reflections upon the caſe of E. F. (pages 98, 99) I mentioned a *full diet* as allowed with the ſtimulant method of cure, which I ſuppoſed to have kept up the irritation of the ſyſtem, and cauſed the immenſe continued diſcharge by the expoſed ſurfaces of the wounds, which

became like old ulcers; and the ſyſtem was ſo diſtreſſed as to take on the action of hectic, which is retained in a degree for ſome time after the cure. A caſe which I ſhall afterwards relate (of George Clark), confirmed what I before from *theory* conjectured: on the *ninth* day a *counter-irritation* took place, by means of a violent diarrhœa; the diſeaſed action of the inteſtines, and the irritation of the ſphincter ani, ſuſpended the too great ſecretion of the ſores, and the ſurface became almoſt quite *dry*. Between this and its again ſecreting plentifully, there was a *point* or an *equilibrium* of action, at which the ſkinning proceſs was more rapid than I ever before beheld it in any ſubject. This accidental explanation of my preconceived theory, induced me to profit by it in ſubſequent caſes. I have with marked good effect produced an artificial counter-irritation with cathartics, and brought on a ſtate in the ſecreting ſurface which has very materially facilitated the proceſs of *ſkinning*--a proceſs over which art has, as yet, acquired very little influence. In the intervals of the uſe of cathartics, the diet was bland and nutritive, ſuch as bread and milk night and morning, boiled meat with potatoes for dinner, and no fermented liquor."

We have formerly mentioned, in terms of approbation, the practice of Mr. Cleghorn, a brewer, in Edinburgh, in caſes of extenſive burns. Mr. Kentiſh's remarks, on the applications he recommends, are well worthy of being noticed before we take leave of this ſubject.

Mr. Cleghorn's ideas were communicated to the late Mr. John Hunter, and by him recorded in the ſecond volume of Medical Facts and Obſervations. They are remarkable for candour in the relation of facts; the writer avows himſelf unbiaſſed by any theoretical opinion, adhering ſtrictly to appearances reſulting from experience, ſo as to enable him to *conclude*, that the certain repeated effects were produced by as certain known cauſes. Of this communication Mr. Kentiſh gives the following account.

"Mr. Cleghorn," ſays he, "recommends the immediate application of vinegar, which is to be continued for ſome hours, by any the moſt convenient means, until the pain abates. Should it return, the vinegar is to be repeated. If the burn is ſo ſevere as to have deſtroyed any part, when the pain has ceaſed it is to be covered with a poultice made of white bread and milk, which remains ſix, or at moſt eight hours; when removed, the part is to be entirely covered with very finely powdered chalk, until every moiſt appearance upon the ſurface of the ſore has diſappeared, when it is again to be covered with the poultice. The ſame mode is then to be purſued every night and morning until the cure is complete. If the uſe of poultices appear to relax the wounds too much, they are to be covered with a plaſter or ointment made

with white lead, but the chalk is ſtill to be uſed next the wound.

" 'In reſpect to general remedies,' ſays Mr. C. 'I allow my patients to eat boiled or roaſted fowl, or, in ſhort, any plain-dreſſed meat they like; and I do not object to their taking (with moderation, however) wine, water and ſpirits, ale, or porter. My applications, as hath been already obſerved, allay pain and inflammation, and alſo always either prevent or remove feveriſhneſs; and at the ſame time (if one may judge from their effects) they have powerful antiſeptic virtues; I have never had occaſion to order bark or any internal medicines whatever, and I have only once thought it neceſſary to let blood. When a patient is coſtive, I order boiled pot-barley and prunes, or ſome other laxative nouriſhing food, and ſometimes an injection, but never any *purgatives*. It is diſtreſſing to a patient with bad ſores to be often going to ſtool. Beſides, I have remarked that weakneſs and languor (which never, in my opinion, haſten the cure of any ſore) are always brought on, more or leſs, by purgatives. From the effects too I have felt them have upon myſelf, and obſerved them to have upon others, they do not ſeem to me to have ſo much tendency to remove heat and feveriſhneſs, as is generally imagined; and I ſuſpect that, contrary to the intention of adminiſtering of them, they oftener carry off *uſeful humours* than *hurtful ones*. But I am going out of my depth, and expoſing myſelf to criticiſm, by ſpeaking upon a ſubject that I ſurely muſt be ignorant of; I will therefore return to my vinegar. I have already ſaid that I always prefer *wine* vinegar when it is to be had; I have, however, uſed, with very good effect, vinegar made of ſugar, gooſeberries, and even alegar; but whichever of them is taken, it ought to be *freſh* and *lively taſted*. I once made ſome trials (on a burn I met with myſelf) of oil of vitriol diluted with water, and of different degrees of ſtrength; but I found its effects to be the very reverſe of vinegar, for it increaſed the pain and heat even when it was pretty much diluted. I make no doubt but diſtilled vinegar might do; but ſince the common ſort, when freſh and good, has in every caſe been ſo efficacious, there ſeems to be no occaſion to attempt improving upon it; and as acids are of a pungent penetrating nature, perhaps it would not be ſafe to apply one too ſtrong to a raw and tender ſore. Even the common vinegar, only by being uſed too *cold*, affected two of my patients with *tremblings* and *chillneſs*, which alarmed me a good deal. I removed theſe ſymptoms indeed (as I before mentioned) very readily by warming the patient's feet with cloths dipped in warm water, and giving them warm water and ſpirits to drink; but ever ſince I have been careful to uſe precautions againſt the like ſymptoms, particularly in cold weather, by *warming* the vinegar a *little*, placing the pati-

ents near the fire, giving them something *warm internally*, and, in short, by keeping them in every respect *in a comfortable condition*.'

"The number of cases related by Mr. Cleghorn in his letters to Mr. Hunter, besides a still greater number he has attended during a period of seventeen years, demand a degree of attention and investigation, more particularly after I have been offering what at first appearance may be supposed to be a very different mode of practice. The vinegar which Mr. Cleghorn relies the most upon, is that made of the *best white wine*, and even this is only efficacious whilst it remains *fresh* and *lively tasted*, and must be changed or renewed as soon as it becomes vapid, or has lost its spirit. Do not these remarks made by Mr. Cleghorn himself, plainly point out to us that the great efficacy of his remedy resides in the proportion of alcohol, or spirit remaining in the vinegar, after it had undergone the acetous process? It is apparent, from the experiment he made upon himself, with the diluted sulphuric acid, that the acid alone is not the part of the application to be depended upon.

"I have not the pleasure of knowing Mr. Cleghorn, but should these observations fall into his hands, I should be happy if he would try the use of alcohol, and appreciate its merits with vinegar. It would also be worth observation to try if spirit, added to the vapid vinegar, would restore to it those curative powers which it before possessed. I purpose trying it myself, should a favourable occasion occur; but it would be much sooner determined by Mr. Cleghorn, as with him the powers of the vinegar are ascertained, whereas, with me, I shall have to ascertain its powers before I can make a comparison.

"The next application Mr. Cleghorn makes, is powdered or scraped chalk: this is confessedly used as an absorbent, and, from the relation of the cases, with very great benefit. It was with this intention that I used large quantities of powdered *lapis calaminaris* in the case related of E. F.; yet in that case I found it insufficient, and was obliged to have recourse to substances of a caustic nature. It will be seen that I attributed the abundant discharge in that case to a too great excitement of the system in that stage of the complaint; and I have no hesitation in saying, that by a very different mode (which I have described) the profuse discharge which formerly accompanied such accidents, may be avoided. I have sometimes, in ulcers in the legs, used chalk as an absorbent; in one or two instances it rather increased the discharge, and gave pain: I attribute these effects, in some degree, to its not being sufficiently powdered, but have not since used it. When I first heard of Mr. Cleghorn's using vinegar and chalk for burns (i. e. before I had read his letter to Mr. Hunter), I supposed he had put on the chalk immediately after the vinegar, with a view of disengaging the carbonic acid gas. From some experi-

ments of Dr. Beddoes upon himself, it would appear, that the skin deprived of its cuticle by a blister, and rendered acutely painful by the contact of the atmosphere, is instantly soothed by its immersion into the carbonic acid gas, and that the pain as soon returns upon changing the medium. How far the acid gas would be of use in the first instance, I have my doubts; I think it could not act sufficiently through the cuticle, but I have no doubt it would be of use in the cure of the ulcers after the sloughs were thrown off; but I mean to put that idea soon to the test, by a course of experiments.

"Mr. Cleghorn further remarks, that in applying the vinegar cold, he brought on *tremblings* and *chillness*, which he afterwards avoided by warming it, and recommends that in all considerable cases it should be so used. This observation is valuable, as it corroborates that by experience, which is theoretically right, viz. the continuance of the stimulus of heat. The *chillness* and *shiverings* are here mentioned as being brought on by the application of the *cold* vinegar. What is not a little extraordinary is, that no mention is made by any author whatever (that I know) of the violent shiverings which, in any burn of consequence, I have universally found to be the first symptom that occurs, and from which, latterly, I have been enabled to form a prognosis, which, if not always certain, is a great guide to me in practice; for the danger is in proportion to the *violence* of this symptom. The remarks respecting the general or internal mode of treatment are highly interesting; he is the first author who, in such cases, has shewn the fallacy of what is termed the antiphlogistic method of treatment. His idea of purgatives carrying off useful, as well as noxious humours, from the system, is certainly very just: great evacuations by the bowels are always *weakening*, as well as distressing, to patients so situated. When large opiates are used, means to prevent constipation are necessary; but need not be carried to the effect of purging.

"Is it not wonderful that the precepts of *bleeding* and *purging* in all such cases should for *ages* have been taught in the schools, and that an unprejudiced observer, as it were with a glance at the subject, should in a moment point out the absurdity of such a treatment!—But let us not be offended at having our errors pointed out by one who is not in the profession: on the contrary, it is worthy such a liberal, nay, I might almost add, sacred profession as ours, trusted as we are with the lives, consequently with the happiness, of the community at large, to confess our faults, and profit of every opportunity to *reform* them. By such conduct we should attone for our errors, and should give the best pledge for the future confidence of the public; which, if we so act, we deserve, and ought to possess."

CHAP. VI. Of INFLAMMATORY TUMORS.

Inflammatory Tumors are ſuch as are quick in their progreſs when compared with thoſe of the indolent kind, and are attended with conſiderable pain and other ſymptoms of inflammation. We have here mentioned ſuch only whoſe treatment more properly belongs to the province of the ſurgeon, and which are ſpoken of according to their ſituations in the different parts of the body.

Sect. I. Inflammation *and* Abscess *of the* Breasts *of Women.*

This diſorder occurs moſt frequently in nurſes by the ſtoppage of the milk, which is often occaſioned by ſudden or imprudent expoſure to cold.

In the early ſtages of the affection, reſolution is always to be attempted, unleſs the ſwelling appears to have an evident tendency towards ſuppuration, in which caſe it is to be promoted by the methods to be hereafter pointed out. The remedies uſed in inflammation, in general, but particularly the early application of leeches, ſeem uſeful in every caſe of inflammation of the breaſts. When the patient happens to be nurſing indeed, a ſudden evacuation of blood is apt to diminiſh the quantity of milk: in ſuch caſes, therefore, blood is to be extracted in ſmall quantities at a time, if bleeding from the ſyſtem ſhould be deemed neceſſary. The application of cooling poultices of vinegar and water, thickened with crumb of bread and linſeed meal, is adviſable. When ſuppuration has taken place, the matter is to be diſcharged by making an inciſion in the moſt depending part of the tumor, as will be preſently noticed.

The late Mr. Juſtamond, who paid particular attention to complaints of the breaſt, remarks, that this is uſually made very light of by practitioners in ſurgery, from a ſuppoſition that it always gets well in time without any thing being done to it, except keeping the part covered with a large bread and milk poultice, and that it never degenerates into a ſchirrous tumor or cancer. He thinks, however, that this is a miſconceived opinion; for the teſtimony of Aſtruc, and many other writers, may be adduced in ſupport of a contrary doctrine, and ſome inſtances certainly have occurred of cancers which were traced by the patients themſelves from milk abſceſs in the breaſt. This indeed is to be conſidered as a *poſſible*,

rather than a probable event; but even this proves the neceſſity of paying due attention to a diſeaſe which is in any caſe capable of ſo unhappy a reſult.

One argument advanced in ſupport of the induration of the milk breaſt not degenerating into a ſchirrus, is, that they are diſeaſes of different parts; the ſchirrus being a hardneſs of the mammary glands, and the other complaint being merely an induration of the cellular and adipoſe membrane of the breaſt. This we apprehend to be a poſition erroneous both in itſelf and in the conſequence deduced from it. For the diſeaſe being acknowledged on all ſides to conſiſt originally in a coagulation of the milk, it follows that it muſt neceſſarily exiſt in thoſe parts deſtined by nature for the ſecretion, reception, and conveyance of that fluid; which are the mammary glands, and the lactiferous tubes proceeding from them. Theſe lactiferous tubes pervade the whole ſubſtance of the breaſt, and it is by their being diſtended with coagulated milk, that the cells of the cellular ſubſtance become compreſſed on all ſides, ſo as to exhibit the appearance of the induration being ſeated in them. It may be urged, indeed, that this compreſſion of the ſides of the cellular ſubſtance being continued for a long time, the cells will not be able to recover their tone, even though the obſtruction of the lactiferous tubes that run through them ſhould be removed; and that the induration will therefore ſtill ſubſiſt. Whether this be the caſe or not, which it is impoſſible to determine, yet, admitting that the induration exiſted only in the cellular membrane, this would be no ſort of proof that the complaint would not degenerate. For all ulcerated cancers are accompanied with indurations of the cellular and adipoſe membrane, which, indeed, is one of the ſtrongeſt marks of the true cancer. Theſe ſchirrous hardneſſes of the cellular membrane are indeed as difficult to cure as any other part of the diſeaſe; and from the conſideration of that dreadful ſpecies of ſchirrus or occult cancer before deſcribed, which ſeizes the whole ſubſtance of the breaſt, ſeem to be of a more malignant nature, than a ſchirrus of the mammary glands alone. So that in whatever point of view we may conſider the affection of the milk breaſt, whether as a diſeaſe of the mammary glands and of the lactiferous tubes proceeding from them, or merely as a diſorder of the cellular and adipoſe ſubſtance of the breaſt, it is equally poſſible that it may degenerate into a ſchirrus.

It muſt be acknowledged, however, that the inſtances of this degeneracy are rare, when compared with the number of perſons who are troubled with the milk breaſt. Neither is it neceſſary to ſuppoſe that the diſeaſes, though ſeated in the ſame parts, are originally the ſame. The milk induration ſeems to become a ſchirrus merely from inattention, neglect, or improper treatment;

but the poſſibility of ſuch an event calls for every exertion in our power to prevent it. Aſtruc obſerves, that abſceſſes of the breaſt often leave indurations of the glands, when ſome of the obſtructed parts remain unſuppurated. This ſeems to be the exact ſtate of the caſe, and, like moſt of that accurate author's obſervations, very juſt. The matter is brought about, probably, in the following manner, which, if it be really the caſe, will ſerve not only to account for the variety of opinions on this head, but alſo to reconcile them. Theſe complaints laſt four, ſix, eight, and ten months, when treated with the conſtant application of a bread and milk poultice, and when at length the abſceſs has been healed, and there has appeared no further diſpoſition to ſuppuration, the complaint has been conſidered as cured; and though there ſhould remain *ſome of the obſtructed part unſuppurated*, yet there being no more pain, it is concluded, that theſe remains will go away of themſelves, merely by keeping the part warm. This, indeed, does frequently happen; but it alſo happens ſometimes that the patient finding ſuch great difference between her preſent ſtate, and that when ſhe was expoſed to the ſufferings occaſioned by a freſh abſceſs collecting and burſting every three or four weeks, perhaps for months together, thinks herſelf well, and neglects this trifling induration; which may, at the ſame time, be ſo ſmall as ſcarce to be diſtinguiſhed by an unſkilful touch. Should ſhe chance to feel a little pain in it now and then, ſhe attributes this to the change of weather, or poſſibly to the neceſſary conſequence of what ſhe cannot but have conſidered as a grievous complaint. Thus the diſeaſe being neglected, may remain for a long time in a tolerably quiet ſtate, till ſome accidental circumſtance puts its virulence into action. Even then it may continue for a long time almoſt imperceptibly increaſing, till it arrive to ſuch a height as to be no longer miſtaken. This event may take place too at ſo conſiderable a diſtance of time from the formation of the abſceſs in the breaſt, that this complaint ſhall no longer be remembered as the cauſe.

But even ſetting aſide theſe conſiderations, it muſt be owned that the coagulation of the milk, and the ſubſequent formation of matter in the breaſts, is a diſeaſe attended with ſo much pain, and frequently of ſo long duration, that the health is often impaired by it. It is a very diſagreeable thing to ſee a woman labouring for ſeveral months under a teizing and painful diſorder, which for the moſt part may be prevented, or the duration of which may at leaſt be conſiderably ſhortened. The conſideration of theſe circumſtances, led ſome ſurgeons to a more expeditious and improved mode of treating theſe complaints. Mr. Juſtamond, particularly, abandoning the old practice of perſevering in the uſe of poultices and other relaxing applications, adviſed the free uſe of ſpirituous lotions. He directed three ounces of ſal ammoniac to be diſſolved in a pint of common water, to which an equal quantity

of Hungary-water was added. Rags dipped in this liquor made a little warm, were applied to the whole ſurface of the breaſt. Theſe rags were wetted again as often as they became dry, and ſo flattering were the effects of this application in thoſe caſes where there was a coagulation of the milk ſoon after lying-in, that it appeared as if this ſolution had actually the property of keeping the milk fluid; for, after it had been applied a few hours, the grumous feel was diſperſed, and the breaſt was in general reſtored to its natural ſtate, while the milk flowed freely from the nipple. The following more ſimple formula has anſwered equally well in ſuch caſes:

(No. 44.) ℞ Ammoniæ muriatiæ unc. iij.
Aquæ diſtillatæ
Spiritus vini Gallic. ſing. lib. j.
Fiat Solutio.

The ſame application was tried, and with great ſucceſs, in a number of caſes where it was uſed *before the ſuppuration was formed.* Among others, a lady who had before ſuffered much from one of theſe complaints, and whoſe caſe ſtands the ſecond in our account of the treatment of ſchirrous tumors, (page 387), was brought to bed about a year after that time. On the day after delivery ſhe became very much alarmed at the ſtate of her breaſts, which were now as much ſwelled, and as painful, as they had been at her preceding lying-in. She was directed to apply the ſolution of ſal ammoniac in water, and Hungary-water, as mentioned above, and the next day ſhe was perfectly free from pain, and the coagulation diſperſed. She continued the application, however, for a couple of days, and had no return of the complaint. The circumſtance of this ſwelling yielding ſo readily to the ſolution of ſal ammoniac, which produced no effect on the former ſwelling in the ſame patient, ſeems to eſtabliſh the difference between theſe two complaints, and to ſhew that the former was beginning to degenerate into a *ſchirrous* tumor. But there was one caſe of the milk breaſt in which this method was tried, and which was of a ſtill more remarkable nature.

In the year 1776, the wife of a ſervant of the duke of Montague, having been brought to bed the preceding day, was ſeized with a coagulation of the milk. The ſize of the breaſt was immenſe, the pain to the higheſt degree excruciating, the glands under the arm-pit ſwelled, and in a word the whole diſeaſe ſo violent, that ſhe was unable to move the arm on that ſide. Her pulſe was at the ſame time very low, ſhe having ſuffered much at her delivery. The late Mr. Juſtamond, whoſe patient ſhe was, thinking it neceſſary, from the intenſeneſs of the pain in this caſe, to join an anodyne with the ordinary ſolution, directed the following:

(No. 45.) ℞ Capit. papaver. contuſor. No. xii.
Flor. ſambuc. manip. ij.
Coque in aq. fontanæ lbiſs uſque ad lib. j. Colato liquore adde
Ammon. muriat. unc. iij. deinde adde
Camphor. (in ſpirit. vin. ſolut.) drach. j. Miſce.

This liquid being mixed with an equal quantity of brandy, was applied warm; cloths being dipt into it and ſpread over all the breaſt, the arm-pit, and the arm itſelf, which was much diſtended. The whole was directed alſo to be attentively wetted again with the warm liquor as often as the rags became dry. In ſix hours after the application ſhe experienced great relief, and on the following day the ſwelling was found to be conſiderably diminiſhed, the pain almoſt gone, and the arm reſtored to its functions. In leſs than three days the breaſt was reduced to its natural ſize, and the complaint entirely diſſipated; however, ſhe continued the application for a few days, leſt ſhe ſhould have a relapſe, but the cure proved permanent. It is impoſſible to ſay what would have been the event of this caſe had the breaſt advanced to ſuppuration; but from the uncommon diſtenſion of the part, the excruciating torture that was the conſequence of it, and the weak ſtate of the patient, it is probable ſhe would have ſunk under a diſeaſe, which is ſuppoſed to be attended with *no kind of danger*.

Thus far we have been ſpeaking of the *unſuppurated ſtate* of the milk breaſt; it now remains to conſider what is to be done when matter is already formed, in which ſtate it moſt frequently comes under our inſpection. For though the diſeaſe be in general ſlow in its progreſs, yet the firſt formation of matter is often very ſudden. It has already been obſerved, that in the ordinary mode of treating theſe milk breaſts with bread and milk poultices, it frequently happens that the ſuppuration is renewed once a fortnight, once a month, or once in ſix weeks, for ſeveral months together, with great pain and inconvenience to the patient. Now, although the ſolution of ſal ammoniac will not cauſe the re-abſorption of matter when once it is formed, yet, Mr. Juſtamond aſſerts, that it will prevent its forming a ſecond time, when it is once let out. He tried it in a great number of caſes, and ſeldom knew it to fail; ſo that, by his account, the milk breaſts treated in this manner are not of longer duration than three weeks, one month, or ſix weeks at fartheſt, while the others frequently continue for ſeveral months, and ſometimes, in the end, leave remains of induration behind them. In one caſe where this method failed, the patient was labouring the whole time under a febrile affection, but even in this inſtance the complaint did not laſt more than three months. Two ſiſters, living next door to each other, and lying-in nearly at the ſame time, were both affected with a coagulation of the milk. Theſe caſes both advanced to ſuppuration. One of theſe ladies

had previouſly been treated for a ſchirrous tumor, the other had no diſeaſe in her breaſt. The former was treated with the ſolution of ſal ammoniac; the latter with bread and milk poultices. The firſt was well within the month, the laſt remained ill for four months. Theſe obſervations appear to eſtabliſh the advantage of the ſolution of ſal ammoniac above that of the bread and milk cataplaſm in theſe caſes. What good, indeed, are we to expect from the latter application in theſe complaints? It is uſed as an emollient, to relax the parts and eaſe the pain; but does not this relaxation produce more miſchief than it does good? The veſſels are already too much diſtended by the influx of milk; the application which really does relax and keep them open, expoſes them to a greater influx of milk without appearing to have any effect upon the contents that are already clotted. Beſides, is it not probable, that as the poultice becomes dry, the milk itſelf may be abſorbed from it into the veſſels already diſtended, and thereby add to the coagulation? The ſolution of ſal ammoniac, on the contrary, even if it ſhould not poſſeſs the property here aſcribed to it of keeping the milk fluid, yet being mixed with ſpirit, which adds to its own aſtringency, is more likely to be advantageous in this caſe from that very quality. For if the ſides of the diſtended veſſels be contracted by the power of any aſtringent application, they will not only be more diſpoſed to reſiſt the farther accumulation of any fluid, but their diameters being leſſened, and their coats ſqueezed, and compelled to act upon their contents, theſe contents will be driven back into thoſe veſſels where the circulation is ſtill free, and where the conſtant motion will ſoon break down and comminute the grumous clots. This is, perhaps, the reaſon why many inflammations, and particularly of the eryſipelatous kind, which have long reſiſted all emollient applications, will ſoon yield to that of the ſpirit of wine and camphor. This is, perhaps, the reaſon why the ſame application, if employed immediately after a ſcald, will frequently prevent the veſication of the ſkin, by contracting the veſſels and reſiſting the impulſe of the diſtending fluids; and it is probably for the ſame reaſon that ſpirit of wine and camphor, if timely applied to ſuperficial whitloes, inſtead of a bread and milk poultice, as is uſually practiſed, will effectually prevent the formation of matter.

There is one circumſtance more to be conſidered with regard to this complaint, and that is, whether it be beſt to ſuffer the abſceſs, when formed, to break of itſelf, or to open it with a lancet. Some ſurgeons are inclined to favour the latter method, and for the following reaſons: When abſceſſes in any part (ſay they) are near the ſkin, and preparing to burſt through it, the diſtenſion the inflamed ſkin ſuffers at this time is extremely painful, and this natural vent may be obſtructed from many cauſes which we cannot account for. Hence the making a ſmall opening with a lancet,

when the ſkin is thin, ſeems to ſave the patient perhaps eight and forty hours of excruciating pain; and beſides, the opening with the lancet, however ſmall, is ſtill larger than that made by the ſpontaneous burſting of the matter. But we ſee that nature ſometimes makes way for the matter by five or ſix different openings; and though a ſmall opening with a lancet may ſave the patient ſome hours' pain, it will not afford ſo ample and uninterrupted a vent to the matter as an orifice formed by nature herſelf. We prefer therefore thoſe means which haſten ſuppuration, and of theſe, none will better promote the object in view than the conjunctly ſtimulant and ſedative qualities of camphor.

(No. 46.) ℞ Olei palmæ unc. iv
Camphoræ in pulv. trit. unc. ſs.
Miſce fiat Linimentum.

A ſimple decoction of poppy heads ſhould be made into a poultice with bread and linſeed meal; and on every application, the ſuppurating part ſhould be ſmeared with the liniment.

Sect. II. *Inflammation of the* Testicles.

An inflammation of the teſticle may ariſe ſpontaneouſly, or it may be produced by accident, ſuch as bruiſes from falls, or otherwiſe; but it moſt commonly originates in gonorrhœas improperly ſtopped. It is but ſeldom, however, that this ſymptom comes on at the beginning of the diſeaſe; nor, indeed, does it often appear, until the inflammatory ſymptoms and pain have moſtly gone off, and the patient flatters himſelf with the hopes of being ſoon well. By this time, however, the inflammation has pervaded not only the urethra, but taken poſſeſſion of the neck of the bladder, caput gallinaginis, or ſeminal ſecretory ducts that open into the urethra from the veſiculæ ſeminales; and, as ſoon as the ſmalleſt ſenſe of pain and weight is felt in the epidydimis, where it always begins when the teſticle is about to ſwell, the running from the urethra ſtops altogether, or diminiſhes in quantity. If the diminution of the running is but ſmall, the ſwelling increaſes ſlowly, but very rapidly if it be totally ſuppreſſed. The pain of the epidydimis now becomes exquiſite on being handled; a ſwelling and hardneſs takes place in it, ſometimes twenty-four hours or more before any ſwelling comes on in the body of the teſticle itſelf; though, in far the greateſt number of caſes, the teſticle ſwells along with the epidydimis, and both together are affected with the moſt violent pain, heat, and ſenſe of weight. The ſpermatic cord then ſwells, and becomes very hard and painful, with a ſhooting pain throughout the whole courſe of it, by which even the loins and kidneys are ſometimes affected. Theſe ſymptoms are often attended with a very high degree of fever, reſtleſſneſs, and extremely quick

pulſe, inſomuch that it will ſometimes be one hundred and twenty in a minute. When the ſymptoms of inflammation run very high, the patient is frequently attacked with nauſea and vomiting, by which the violence of the pain is always augmented; and, in ſhort, the ſeverity of the ſymptoms which affect the whole ſyſtem, bear an exact proportion to thoſe which affect the teſticle, cord, and parts adjacent. It is alſo remarkable, that neither the epidydimis nor teſticle are ever affected, until every ſymptom of pain and running has ceaſed from the urethra; and the more complete the ceſſation of theſe ſymptoms is, the more ſevere will be the ſwelling and pain which the patient perceives in the part. As theſe are the ſymptoms attending an inflammation of the teſticle ariſing from a venereal cauſe, the proper indication of cure evidently is, by every poſſible method, to *recal the running* and other attendants of a gonorrhœa, the preſent diſeaſe being in truth nothing more than a tranſlation of the inflammation from the urethra to the teſticle. Some, indeed, contend, that no communication ſubſiſts between the urethra and teſticle, by which matter can be conveyed from the one to the other. But if this were the caſe, how ſhould the ſemen of the male be conveyed from the teſticles to the urethra? Along the inſide of the veſiculæ ſeminales, it may come to the opening of the vaſa deferentia of one of the teſticles, and through this tube communicate its baneful influence to all the parts of the ſeminal convoluted tubes of the teſticle itſelf. That this is really the caſe, ſeems extremely probable from the cauſes by which a ſwelled teſticle is brought on; theſe being ſuch as are very likely to bring on a retrograde motion in the ſyſtem, viz. draſtic purges, cold, acrid, and aſtringent injections, &c. Beſides, we find that the diſeaſe itſelf originally comes on in a ſimilar manner. Beginning near the top of the urethra, at the back of the glans, it gradually paſſes down that canal, until it reaches the very neck of the bladder; a progreſs, as far as we can judge, the very ſame with that ſuppoſed to be the courſe uſually taken by the infection. Notwithſtanding the ſymptoms of inflammation which attend a ſwelled teſticle may be exceedingly violent, they terminate much leſs frequently in ſuppuration than in other parts of the body. Indeed, we may ſay, that no ſuppuration of this kind ever will take place, unleſs by much inattention and miſmanagement on the part of the ſurgeon or patient; nay, with proper care and attention, we may venture to ſay, that a ſwelled teſticle might always be prevented. For this purpoſe, we ſhould ſeldom make uſe of any ſtrong aſtringent injections, nor ever allow the patient to expoſe himſelf to cold, by bathing the parts in cold water, or otherwiſe. Draſtic purges ſhould certainly be avoided; and we ought to cauſe the patient to ſuſpend his teſticle in a bag truſs throughout the whole courſe of the diſeaſe. But if, by any accident, ſuch as violent exerciſe on foot or horſeback, unavoidable

expoſure to rain, &c. the teſticle ſhould happen to be affected, we ought inſtantly to have recourſe to blood-letting, eſpecially if the patient be young and plethoric. Indeed in no caſe whatever is topical blood-letting of greater efficacy than in the diſeaſe we treat of. Ten or twelve leeches ought, therefore, to be applied all over the ſcrotum, and their diſcharge promoted by a warm fomentation, or large emollient poultice ſufficient to cover not only the teſticle, but the penis alſo. The inteſtines ought to be emptied by a large emollient injection, which ought to be repeated occaſionally, until the ſwelling abates. As the pain is always extremely ſevere, it ought to be abated by large doſes of tincture of opium, the moſt proper vehicle for which is mucilage of gum-arabic, or ſtarch boiled to the ſame conſiſtence. The following glyſter has often an aſtoniſhing effect in allaying the pain:

(No. 47.) ℞ Mucilag. amyli unc. vj.
Olei olivæ unc. ij.
Tinct. opii drach. j.
Miſce fiat Enema.

The leeches ought to be repeated, as well as the anodyne injection, if the pain and ſwelling continue; and the diſcharge of blood muſt always be promoted by warm fomentations. The patient may alſo ſtay half an hour every day in the ſemicupium as warm as is convenient; and the teſticle may be fomented frequently through the day, with a flannel cloth wrung out of boiling decoction of poppies. He muſt lie conſtantly in an horizontal poſture, be kept on a farinaceous diet, and no injection of any kind by the urethra muſt be uſed; but every ſecond night give the patient three grains of calomel, which will purge itſelf off in the morning, or if not, the following purgative may be exhibited:

(No. 48.) ℞ Magneſiæ vitriolatæ unc. j.
Antimon. tartar. gr. j.
Aquæ bullientis ℥vj.
Fiat Solutio.

The uſual effect of this courſe, if perſiſted in for two or three days, is, that the running comes on again, the pain and ſwelling of the teſticle gradually ſubſide; and, if proper attention is paid by the ſurgeon and patient, the latter will generally be quite free from pain on the third or fourth day. A return of the diſcharge, on which ſo much depends, may pretty certainly be effected by introducing into the urethra a bougie ſmeared with a little balſam of copaiba. We ſhould give alſo, for ſome time, every night at bed-time, two grains of calomel, or one of calcined mercury, in a pill. If, however, through any unforeſeen accident, or as it may ſometimes happen from peculiar morbid affection, we ſhould ſtill fail in removing the inflammation, and a *ſuppuration* ſhould take place, we ought to bring it forward as faſt as poſſible by emollient poultices, premiſing the uſe of (No. 46.) on each application.

As ſoon as the matter is formed, we ought to diſcharge it, by making an opening with an abſceſs lancet in the moſt depending part, treating the ſore afterwards as we would do a collection of matter in any other part of the body, namely, by ſecuring a proper outlet for the matter till the cavity has had time to fill up with healthy granulations, and afterwards encouraging the proceſs of cicatrization.

Sect. III. *Of* Venereal Buboes.

A ſwelling of any of the lymphatic glands of the body is called a *bubo;* and when ſuch a ſwelling proceeds from venereal poiſon, it is termed a *venereal bubo.* Theſe ſeldom or never appear except in the lymphatic glands of the groin, arm-pit, or extremities, and much more frequently in the groin than any-where elſe.

In the treatment of buboes, a ſtrict antiphlogiſtic regimen is to be uſed to promote a reſolution; the application of leeches to the hardened gland is particularly proper. In diſcuſſing venereal buboes, the application of mercurial ointment has a conſiderable effect. After ſuppuration is completely formed, the application of cauſtic to open the bubo is requiſite, leſt it ſhould corrode ſome of the conſiderable blood veſſels, which generally lie contiguous to the bubo. Buboes, when opened by the knife, are ſaid to heal with more difficulty, and generally to leave a ſcar behind them. To allow them to burſt of themſelves, is reckoned for the moſt part proper, except when the collection is ſo conſiderable as to preſs upon the neighbouring blood veſſels. In ſuch a caſe, a ſmall inciſion may be made by the lancet, taking as much care as poſſible to prevent the admiſſion of the external air into the wound. When the edges of the opening grow callous, the application of lunar cauſtic to them becomes neceſſary. During the remaining part of the cure, mercury joined with opium is to be uſed.

This, in few words, is the general practice in theſe caſes; but as the moſt ſerious conſequences are apt to reſult from errors of the ſurgeon, it is of the utmoſt importance that the reader ſhould be made acquainted with the doctrines of Mr. Hunter, who in his excellent treatiſe on the venereal diſeaſe, has given the following account of this often formidable ſymptom.

Mr. Hunter juſtly obſerves, that our preſent knowledge of the *abſorbing ſyſtem,* gives us the moſt important information reſpecting many of the effects of poiſons, and illuſtrates ſeveral ſymptoms of the venereal diſeaſe, in particular that of which we are now to treat. "Prior to this knowledge," ſays he, "we find writers at a loſs how to give a true and conſiſtent explanation of many of the ſymptoms of this diſeaſe. The diſcovery of the lymphatics being a ſyſtem of abſorbents has thrown more light on

many diſeaſes than the diſcovery of the circulation of the blood; it leads in many caſes directly to the cauſe of the diſeaſe.

"The immediate conſequence of the local diſeaſes gonorrhœa and chancre, which is called bubo, as alſo the remote or lues venerea, ariſe from the abſorption of recent venereal matter from ſome ſurface where it has either been applied or formed. Although this muſt have been allowed in general ever ſince the knowledge of the diſeaſe and of abſorption, yet a true ſolution of the formation of bubo could not be given till we had acquired the knowledge of the lymphatics being the only abſorbents. Upon the old opinion of abſorption being performed by the veins, the lues venerea could have eaſily been accounted for, becauſe it could as readily be produced by the abſorbing power of the veins, if they had ſuch, as by the lymphatics; but the difficulty was to ſay how the bubo was formed. There they ſeemed to be at a loſs to account for this diſeaſe, yet they ſometimes expreſſed themſelves as if they had ſome idea of it, although at the ſame time they could have no clear notions of what they advanced; nor could they demonſtrate what they ſaid from the knowledge of the parts and their uſes.

"Buboes are by ſome imputed to the *ſtopping of a gonorrhœa*, or, as they expreſſed it, driving it to the glands of the groin, conformably to the idea they had of the ſwelling of the teſticle. But this is not juſt, for we know of no ſuch power as repulſion; and if it was driven there, it could not be by ſtopping the formation of matter, but by increaſing the abſorption, of which they had no idea."

Mr. Hunter here examines the opinions of authors concerning the formation of a bubo, and proves that, prior to the knowledge of the power of abſorption in the lymphatics, they have made uſe of terms which they could not poſſibly underſtand, and that, till we come ſo low down as the year 1770, nothing was clearly underſtood on the ſubject. At that period, in an abridgement of Aſtruc by Dr. Chapman (ſecond edition), in which he introduces his own knowledge and ideas, we find the abſorbing power of the lymphatics brought in as a cauſe of the formation of buboes.

Conceiving the doctrine of abſorption to be now underſtood, Mr. Hunter proceeds to explain the different modes in which it may take place under circumſtances of a venereal infection.

"The venereal matter," ſays he, "is taken up by the abſorbents of the part in which it is placed: and although the abſorption of the matter and the effects after abſorption are the ſame, whether from the matter of the gonorrhœa, or chancre, yet I ſhall divide the abſorption into three kinds, according to the three different ſurfaces from which the matter may be abſorbed, beginning with the leaſt frequent.

1. "The firſt and moſt ſimple is where the matter either of

a gonorrhœa or chancre has only been applied to some sound surface, without having produced any local effect on the part, but has been absorbed immediately upon its application. Instances of this I have sometimes seen in men, and such are perhaps the only instances that can be depended upon; for it is uncertain in many cases, whether a woman has a gonorrhœa or not. I think, however, I may venture to affirm, that I have seen it in women, or at least there was every reason to believe that they had neither chancre nor gonorrhœa preceding, as there was no local appearance of it, nor did they communicate it to others who had connection with them.

"It must be allowed that this mode of absorption is very rare; and if we were to examine the parts very carefully, or enquire of the patient very strictly, probably a small chancre might be discovered to have been the cause, which I have more than once seen. For when we consider how rarely it happens from a gonorrhœa, in which the mode of absorption is similar, we can hardly suppose it probable that it should here arise from simple contact, the time of the application of the venereal matter being commonly so very short. We might indeed suppose the frequency to make up for the length of time; which we can hardly allow, for the same frequency should give the chance of producing it locally. Therefore very particular attention should be paid to all the circumstances attending such cases.

"There is however no great reason why it should not happen, and the possibility of it lessens the faith that is to be put in the supposition, that the disease may be years in the constitution before it appears; for whenever it does appear in a lues venerea, its date is always carried back to the last local affection, whether gonorrhœa or chancre, and the latter connections are never regarded.

2. "The second mode of absorption of this matter is more frequent than the former, and it is when the matter applied has produced a gonorrhœa; and it may happen while the complaint is going on, either under a cure or not. Some of the matter secreted by the inflamed surfaces having been absorbed and carried into the circulation, produces the same complaints as in the former case, by which means a person gives himself the lues venerea.

3. "The third mode is the absorption of the matter from an ulcer, which may either be a chancre, or a bubo. This mode is by much the most frequent; which, with many other proofs, would shew, that a sore or ulcer is the surface most favourable for absorption. Whether ulcers in every part of the body have an equal power of absorption I have not been able to determine; but I suspect that an ulcer on the glans, is not so good a surface for absorption as one on the prepuce, although I have seen both buboes

and the lues venerea arife from the former, but not fo often as from the latter.

4. " To thefe three methods may be added a fourth, *abforption from a wound;* which I have already remarked is perhaps not fo frequent as any of the former.

" As the venereal poifon has the power of contaminating whatever part of the body it comes in contact with, it contaminates the abforbent fyftem, producing in it local venereal complaints. It is hardly neceffary to obferve, that what is now commonly underftood by a bubo, is a fwelling taking place in the abforbing fyftem, efpecially in the glands, arifing from the abforption of fome poifon, or other irritating matter; and when fuch fwellings take place in the groin, they are called buboes, whether from abforption or not, but are moft commonly fuppofed to be venereal, even although there has been no vifible preceding caufe. This has been fo much the cafe, that all fwellings in this part have been fufpected to be of this nature; femoral ruptures, and aneurifms of the femoral artery, have been miftaken for venereal buboes."

Mr. Hunter calls every abfcefs in the abforbing fyftem, whether in the veffels or the glands, arifing in confequence of the abforption of venereal matter, by the name of a bubo.

" This matter," continues he, " when abforbed from either of the four different furfaces, which are common furfaces, wounds, inflamed furfaces, and ulcers, is carried along the abforbent veffels to the common circulation, and in its paffage often produces the fpecific inflammation in thefe veffels; the confequence of which is, the formation of buboes, which are venereal abfceffes, exactly fimilar in their nature and effects to a chancre; the only difference being in fize. As the abforbents with the glands are immediately irritated by the fame fpecific matter which has undergone no change in its paffage, the confequent inflammation muft therefore have the fame fpecific quality, and the matter fecreted in them be venereal.

" As this fyftem of veffels may be divided into two claffes, the veffels themfelves, and their ramifications and convolutions, called the lymphatic glands, I fhall follow the fame divifion in treating of their inflammations.

" Inflammation of the veffels is not nearly fo frequent as that of the glands. In men, fuch inflammations, in confequence of chancres upon the glans or prepuce, generally appear like a chord leading along the back of the penis from the chancres. Sometimes they arife from the thickening of the prepuce in gonorrhœas, that part in fuch cafes being generally in a ftate of excoriation, as was defcribed when on that form of the difeafe. Thefe chords often terminate infenfibly on the penis, near its root, or near the pubes; at other times they extend further, paffing to a lymphatic gland in the groin: this chord can be eafily pinched up between

the finger and thumb, and it often gives a thickneſs to the prepuce, making it ſo ſtiff at this part as to make the inverſion of it difficult, if not impoſſible, producing a kind of phymoſis.

"I think I have obſerved this appearance to ariſe as frequently from the gonorrhœa, when attended with the before-mentioned inflammation and tumefaction of the prepuce, as from chancres; which if my obſervation is juſt, is not eaſily accounted for. I have obſerved that abſorption is more common to ulcers than inflamed ſurfaces; or at leaſt the formation of a bubo in the gland, and its effects in the conſtitution, are more common from an ulcer; but it may be remarked, that the inſide of the prepuce, from whence this chord appears to ariſe, is in an excoriated ſtate. It is poſſible that this effect may ariſe from the lymphatics ſympathiſing with the inflammation of the urethra; but I believe the affection is truly venereal; or it is poſſible that even the abſorption of the coagulable lymph which was produced from the venereal inflammation, and which is the cauſe of the tumefaction, may have the power of contamination, as appears to be the caſe in the cancer.

"The thickening, or the formation of this hard chord, probably ariſes from the thickening of the coats of the abſorbents, joined with the extravaſation of coagulable lymph, thrown in upon its inner ſurface, as in inflamed veins.

"This chord often inflames ſo much as to ſuppurate, and ſometimes in more places than one, forming one, two, or three buboes, or ſmall abſceſſes, in the body of the penis. When this is going on, we find in ſome parts of this chord a circumſcribed hardneſs, then ſuppuration takes place in the centre, the ſkin begins to inflame, the matter comes nearer to it, and the abſceſs opens like any other abſceſs."

Mr. Hunter ſays he has ſeen a chain of theſe little abſceſſes running along the upper part of the penis through its whole extent.

"This," ſays he, "may be ſuppoſed to be exactly ſimilar to the inflammation and ſuppuration of a vein after being wounded and expoſed.

"Inflammation of the glands is much more frequent than the former, and ariſes from the venereal matter being carried on to the lymphatic glands; the ſtructure of which appears to be no more than the ramifications and reunion of the abſorbent veſſels, by which means they form theſe bodies.

"From this ſtructure we may reaſonably ſuppoſe that the fluid abſorbed is in ſome meaſure detained in theſe bodies, and thereby has a greater opportunity of communicating the diſeaſe to them than to the diſtinct veſſels, where its courſe is perhaps more rapid; which may account for the glands being more frequently contaminated.

" Swellings of theſe glands are common to other diſeaſes, and ſhould be carefully diſtinguiſhed from thoſe that ariſe from the venereal poiſon. The firſt enquiry ſhould be into the cauſe, to ſee if there is any venereal complaint at ſome greater diſtance from the heart, as chancres on the penis, or any preceding diſeaſe on the penis; to learn if mercurial ointment has been at all applied to the legs and thighs of that ſide; for mercury applied to thoſe parts for the cure of a chancre will ſometimes tumefy the glands, which has been ſuppoſed to be venereal. We ſhould further obſerve, if there be no preceding diſeaſe in the conſtitution, ſuch as a cold, fever, &c. the progreſs of the ſwelling with regard to quickneſs is alſo to be attended to, as alſo to diſtinguiſh it from a rupture, lumbar abſceſs, or aneuriſm of the cural artery.

" Perhaps theſe bodies are more irritable, or more ſuſceptible of ſtimuli, than the veſſels, they are certainly more ſuſceptible of ſympathy; however, we are not yet ſufficiently acquainted with the uſe of theſe glands to be able to account ſatisfactorily for this difference.

" It would appear in ſome caſes, that it is ſome time after the abſorption of the venereal matter before it produces its effects upon the glands; in ſome it has been ſix days at leaſt. This could only be known by the chancres being healed ſix days before the bubo began to appear; and in ſuch caſes it is more than probable that the matter had been abſorbed a much longer time before, for the laſt matter of a chancre moſt probably is not venereal; and indeed it is natural to ſuppoſe that the poiſon may be as long before it produces an action on the parts, when applied in this way, as it is either in the urethra, or in forming a chancre; which I have ſhewn to be ſometimes ſix or ſeven weeks.

" The glands neareſt to the origin of the diſeaſe are in general the only ones that are attacked, as thoſe in the groin, when the matter has been taken up from the penis in men. In the groin, between the labia and thigh, and the round ligaments, when abſorbed from the vulva, in women.

" I think there is commonly but one gland at a time that is affected by the abſorption of venereal matter, which if ſo becomes in ſome ſort a diſtinguiſhing mark between venereal buboes and other diſeaſes of theſe bodies.

" We never find the lymphatic veſſels, or glands, that are ſecond in order, affected; as thoſe along the iliac veſſels, or back; and I have alſo ſeen when the diſeaſe has been contracted by a ſore or cut upon the finger, the bubo come on a little above the bend of the arm, upon the inſide of the biceps muſcle; and in ſuch where the bubo has come in that part none have formed in the arm-pit, which is the moſt common place for the glands to be affected by abſorption.

" But this is not univerſal, although common, for I was informed by a gentleman who contracted the diſeaſe in the beforementioned way, that he had buboes both on the inſide of the biceps muſcle, and in the arm-pit. Another caſe of this kind I have heard of ſince; why it is not more common is perhaps not eaſily explained.

" It might be ſuppoſed that the matter was weakened or much diluted by the abſorptions from other parts by the time it gets through theſe neareſt ramifications, and therefore has not power to contaminate thoſe which are beyond them; but it is moſt probable that there are other reaſons for this. I once ſuſpected that the nature of the poiſon was altered in theſe glands as it paſſed through them, which was the reaſon why it did not contaminate the ſecond or third ſeries of glands; and alſo why it did not affect the conſtitution in the ſame way as it did the parts to which it was firſt applied; but this explanation will not account for the next order of glands to ſuppurating buboes not being affected by the abſorption of venereal matter. It appears to me that the internal ſituation of the other glands prevents the venereal irritation from taking place in them; and this opinion is ſtrengthened by obſerving when one of theſe external glands ſuppurates and forms a bubo, which is to be conſidered as a large venereal ſore or chancre, that the abſorption from it, which muſt be great, does not contaminate the lymphatics or glands next in order, by the venereal matter going directly through them.

" If this be true, then the ſkin would ſeem to be the cauſe of the ſuſceptibility of the abſorbents to receive the irritation. Whether the ſkin has the power inherent in itſelf, or acquires it from ſome other circumſtance, as air, cold, or ſenſe of touch, is not eaſily aſcertained, but whichever it be, it ſhews that the venereal matter of itſelf is not capable of irritating, and that it requires a ſecond principle to complete its full effect, that is, a combination of the nature of the poiſon and the influence of the ſkin, and that influence muſt be by ſympathy, and therefore weaker than if acting in the ſame part, that is, the ſkin itſelf; which perhaps is the reaſon why the venereal matter does not always affect thoſe veſſels and glands, while it always does the ſkin, if inſerted into it.

" The ſituation of buboes ariſing from the venereal diſeaſe in the penis, are, in men, in the abſorbent glands of the groin; if a gonorrhœa is the cauſe of a bubo, one groin is not exempted more than the other, both may be affected; but if a bubo ariſes in conſequence of a chancre, then the groin may be generally determined by the ſeat of the chancre; for if the chancre is on one ſide of the penis, then the bubo will commonly be on that ſide; however this is not univerſally the caſe, for I have known inſtances, although but few, where a chancre on one ſide of the

prepuce, or penis, has been the cauſe of a bubo on the oppoſite ſide, which if ariſing from that chancre is a proof that the abſorbents either anaſtomoſe, or decuſſate each other. If the chancre be on the frænum, or on the middle of the penis, between the two ſides, then it is uncertain which ſide will be affected."

Mr. Hunter here obſerves, that the ſituation of the glands of the groin is not always the ſame, and therefore that the courſe of the abſorbent veſſels will vary. Accordingly buboes may take place either higher or lower than uſual, and indeed no part of the body, under certain circumſtances, is exempt from the diſeaſe, ſince every gland is capable of venereal infection.

Mr. Hunter next thinks it neceſſary to remark on buboes as they appear *in women*.

"One would naturally ſuppoſe," ſays he, "that what has been ſaid of this complaint in the lymphatic glands in men, would be wholly applicable to women; and alſo that nothing peculiar to women could take place; but the ſeat of abſorption is more extenſive in this ſex, and the courſe of ſome of the abſorbents is alſo different, from whence there are three ſituations of buboes in women, two of which are totally different from thoſe in men, and theſe I ſuſpect to be in the abſorbents.

"The third ſituation of buboes in this ſex is ſimilar to that in men, and therefore they may be divided into three, as in men.

"When buboes ariſe in women where there is no chancre, it is more difficult to know whether they are venereal or not than in men; for when they ariſe in men without any local complaint, it is known that no ſuch complaint exiſts, and therefore the bubo cannot be venereal, excepting by immediate abſorption; but in women it is often difficult to know whether there be any infection preſent or not; and therefore in order to aſcertain the nature of the bubo, attention muſt be paid to its manner of coming on, progreſs, and other circumſtances.

"When chancres are ſituated forwards, near to the meatus urinarius, nymphæ, clitoris, labia, or mons veneris, then we find that the matter abſorbed is carried along one or both of the round ligaments, and the buboes are formed in thoſe ligaments juſt before they enter the abdomen, without I believe ever going further. Theſe buboes I ſuſpect not to be glandular, but inflamed abſorbents; and if ſo it ſtrengthens the idea that it is only an external part that can be affected in this way.

"When the chancres are ſituated far back, near the perinæum, or in it, the matter abſorbed is carried forwards along the angle between the labium and the thigh to the glands in the groin, and often in this courſe there are formed ſmall buboes in the abſorbents, ſimilar to thoſe on the penis in men; and when the effects of the poiſon do not reſt here, it often produces a bubo in the groin as in men."

Speaking of the *inflammation of buboes*, and particularly of the ſigns that *diſtinguiſh them from other ſwellings of the glands*, Mr. Hunter ſays,

" The bubo commonly begins with a ſenſe of pain which leads the patient to examine the part, where a ſmall hard tumor is to be felt *. This increaſes like every other inflammation that has a tendency to ſuppuration; and if not prevented, goes on to ſuppuration and ulceration, the matter coming faſt to the ſkin.

" But we find caſes where they are ſlow in their progreſs, which I ſuſpect either ariſes from the inflammatory proceſs being kept back by mercury, or other means; or being retarded by a ſcrofulous tendency, ſuch a diſpoſition in the parts not ſo readily admitting the true venereal action.

" At firſt the inflammation is confined to the gland, which is moveable in the cellular membrane; but as it increaſes in ſize, or as the inflammation, and more eſpecially the ſuppuration, advances, which in all caſes produce rather a common effect than a ſpecific, the ſpecific diſtance is exceeded, the ſurrounding cellular membrane becomes more inflamed, and the tumor is more diffuſed. Some become eryſipelatous, by which means they are rendered more diffuſed and œdematous, and do not readily ſuppurate, a circumſtance often attending the eriſypelatous inflammation.

" To aſcertain what a diſeaſe is, is the firſt ſtep in the cure; and when two or more cauſes produce ſimilar effects, great attention is neceſſary to diſtinguiſh one effect from another, ſo as to come at the true cauſe of each.

" The glands of the groin from their ſituation are liable to ſuſpicion, for beſides being ſubject to the common diſeaſes, they become expoſed to others by allowing whatever is abſorbed to paſs through them; and as the route of the venereal poiſon to the conſtitution is principally through them, and being oftener ill from this cauſe than any other, they often are ſuſpected of this diſeaſe without foundation.

" To diſtinguiſh with certainty the true venereal bubo from ſwellings of thoſe glands ariſing from other cauſes, may be very difficult. We muſt however examine all circumſtances, to aſcertain in what the bubo differs from the common diſeaſes of thoſe glands, whether in the groin or elſewhere; in which examination

* The ingenious author has remarked here, that whenever a perſon has either a gonorrhœa or a chancre, he becomes apprehenſive of a bubo; and as there are in the gonorrhœa, and ſometimes caſes of chancre, *ſympathetic ſenſations* in or near the groin, theſe are ſuſpected by the patient to be beginning buboes, and the hand is immediately applied to the part; and if a gland be felt there, although not in the leaſt increaſed in ſize, the patient's ſuſpicions are confirmed from a belief that he has no ſuch parts naturally.

the apparent cauſes are not to be neglected. I have already given the character of the venereal bubo in general terms; but I ſhall now be more particular, as the two are to be contraſted.

" The true venereal bubo in conſequence of a chancre is moſt commonly confined to one gland. It keeps nearly its ſpecific diſtance till ſuppuration has taken place, and then becomes more diffuſed *. It is rapid in its progreſs from inflammation to ſuppuration and ulceration. The ſuppuration is commonly large for the ſize of the gland, and but one abſceſs. The pain is very acute. The colour of the ſkin where the inflammation attacks is of a florid red.

" It may be obſerved, that the buboes in conſequence of the firſt mode of abſorption, viz. where no local diſeaſe had been produced, will always be attended with a greater uncertainty of the nature of the diſeaſe than thoſe attended or preceded by a diſeaſe in the penis; becauſe a ſimple inflammation and ſuppuration of theſe glands is not ſufficient to mark it to be venereal; but as we always have this diſeaſe in view when ſuch parts as the glands of the groin are the ſeat of the diſeaſe, the patient runs but little riſk of not being cured if it ſhould be venereal; but I am afraid that patients have often undergone a mercurial courſe when there has been no occaſion for it.

" It will perhaps be difficult to find out the ſpecific difference in the diſeaſes themſelves; but I think that ſuch buboes as ariſe without any viſible cauſe are of two kinds, one ſimilar to thoſe ariſing from chancres or gonorrhœa; that is, inflaming and ſuppurating briſkly. Theſe I have always ſuſpected to be venereal; for although there is no proof of their being ſo, yet from theſe circumſtances it is a ſtrong preſumption that they are.

" The ſecond are generally preceded and attended with ſlight fever, or the common ſymptoms of a cold, and they are generally indolent and ſlow in their progreſs. If they ſhould be more quick than ordinary, they become more diffuſed than the venereal, and may not be confined to one gland. When very ſlow they give but little ſenſation; but when more quick the ſenſation is more acute, though not ſo ſharp as in thoſe that are venereal; and moſt commonly they do not ſuppurate, but often become ſtationary. When they do ſuppurate it is ſlowly, and often in more glands than one, the inflammation being more diffuſed, and commonly ſmall in proportion to the ſwelling. The matter comes ſlowly to the ſkin, not attended with much pain, and the colour is different from that of the other, being more of the purple.

* Mr. Hunter obſerves here, that the glands and ſurrounding parts being diſſimilar, inflammation does not ſo readily become diffuſed as when it takes place in a common part.

Sometimes the ſuppurations are very conſiderable, but not painful."

Mr. Hunter next enquires what other cauſes there are for the ſwelling of theſe glands beſides venereal infection, to which he has aſcribed one of the modes of ſwelling; for other cauſes there muſt be to account for the other modes of it. He ſays,

"The firſt thing to be attended to is, whether or not there are any venereal complaints; and if not, this becomes a ſtrong preſumptive proof that they may not be venereal, but proceed from ſome unknown cauſe. If the ſwelling is only in one gland, very ſlow in its progreſs, and gives but little or no pain, it is probable merely ſcrofulous; but if the ſwelling is conſiderable, diffuſed and attended with ſome inflammation and pain, then it is moſt probable that there is a conſtitutional action conſiſting in ſlight fever, the ſymptoms of which are laſſitude, loſs of appetite, want of ſleep, ſmall quick pulſe, and an appearance of approaching hectic. Such ſwellings are ſlow in their cure, and do not ſeem to be affected by mercury, even when very early applied."

The following caſe, introduced by the author to illuſtrate this ſubject, is well worthy of the reader's attention:

"A gentleman had all the ſymptoms of a ſlight fever; the pulſe a little quick and hard, loſs of appetite, and of courſe loſs of fleſh; a liſtleſſneſs and a fallow look. While in this ſtate a ſwelling took place in the glands of one of the groins. He immediately ſent for me," ſays Mr. Hunter, "becauſe he imagined it to be venereal. From the hiſtory of the caſe, I gave it as my firm opinion it was not; in this he had not much faith. The ſwellings were not very painful, and after having acquired a conſiderable ſize they became ſtationary. To pleaſe him I gave him a box of mercurial ointment to be rubbed on the leg and thigh only of the ſide affected, that it might have a ſufficient local effect, and as little go into the conſtitution as poſſible; but it did not appear to be of any ſervice to the ſwellings in the groin, they remaining ſtationary, and almoſt without pain. His friends became uneaſy, and ſent their ſurgeons to him, who without knowing he was my patient, and of courſe without knowing my opinion, imagined that the diſeaſe was venereal, as they talked of giving mercury. With reſpect to the cure, I thought he ſhould go to the ſea and bathe.

"Allowing the chance of the diſeaſe being venereal or not venereal to be equal, I reaſoned upon that ground. His preſent want of health could not be ſuppoſed to ariſe from any venereal cauſe, as it was prior to the ſwelling in the groin, and therefore though the ſwelling was venereal, he was not at preſent in a condition to take mercury, as a ſufficient quantity of that medicine for the cure would kill him; and if it ſhould not be venereal,

that ſtill a greater quantity of mercury muſt be given than what was neceſſary if it was venereal; becauſe its not giving way readily would naturally make the ſurgeon puſh the mercury further; and beſides this diſagreeable circumſtance, the diſeaſe in the groin might be rendered more difficult of cure. But if he went to the ſea his conſtitution would be reſtored; and if the diſeaſe in the groin proved to be venereal, he would be in a proper condition to go through a mercurial courſe, and by that means get rid of both diſeaſes by the two methods. But if I ſhould be right in my opinion, that there was nothing venereal in the caſe, then he would get well by the ſea-bathing alone.

"Theſe arguments had the deſired effect, he went directly to the ſea, and began to recover almoſt immediately. About a fortnight after a ſmall ſuppuration took place in one of the glands; I directed a poultice ſhould be made with ſea-water and applied, and if it broke that it ſhould not be further opened, but poulticed till healed. In ſix weeks he come back perfectly recovered in every reſpect.

"The above appearance, with the conſtitutional affections, I have ſeen take place when there were chancres, and I have been puzzled to determine whether it was ſympathetic, from a derangement of the conſtitution, or from the abſorption of matter.

"I have long ſuſpected a mixed caſe, and I am now certain that ſuch exiſts. I have ſeen caſes where the venereal matter, like a cold or fever, has only irritated the glands to diſeaſe, producing in them ſcrofula, to which they were prediſpoſed.

"In ſuch caſes the ſwellings commonly ariſe ſlowly, give but little pain, and ſeem to be rather haſtened in their progreſs if mercury is given to deſtroy the venereal diſpoſition. Some come to ſuppuration while under this reſolving courſe; and others which probably had a venereal taint at firſt, become ſo indolent that mercury has no effect upon them, and in the end get well either of themſelves or by other means, which I imagine may have induced ſome to think that buboes are never venereal. Such caſes require great attention to be able to determine them properly; and I believe this requires in many caſes ſo nice a judgment that we ſhall be often liable to miſtakes."

Whether the lymphatic glands act as *guards againſt the further progreſs* of any diſeaſe caught by abſorption, Mr. Hunter cannot determine; they cannot however prevent the poiſon from getting a paſſage into the conſtitution in caſes where buboes take place, becauſe theſe glands naturally propagate the ſame diſeaſe as has been produced in them, and in an increaſed degree.

Mr. Hunter makes the following general reflections on the cure of buboes. He declines a diſcuſſion of the opinion of their being a depoſit from the conſtitution, and of the concluſion drawn from

this opinion, that they ought not to be diſperſed; "for," ſays he, "according to this theory, to diſperſe them would be to throw the venereal matter upon the conſtitution. But if this were really the caſe, then there would be no occaſion for the uſe of mercury, provided that the bubo be allowed to proceed, as it would prove its own cure; but even thoſe who were of this opinion were not ſatisfied with the cure which they ſuppoſed nature had pointed out, but gave mercury, and in very large quantities. From the ſame hiſtory of a bubo I have alſo endeavoured to ſhew that there are ſeveral buboes which are not in the leaſt venereal, but ſcrofulous; and that there are alſo buboes which appear to be only in part venereal; or perhaps only a gland diſpoſed to ſcrofula brought into action by the venereal irritation, ſimilar to what happens often from the matter of the ſmall-pox in inoculation. Therefore prior to the method of cure, the true venereal bubo is to be diſtinguiſhed from the others if poſſible. When it is well aſcertained to be venereal, reſolution is certainly to be attempted if the bubo be in a ſtate of inflammation only. The propriety of the attempt depends upon the progreſs the diſeaſe has made. If it be very large, and ſuppuration appears to be near at hand, it is probable that reſolution cannot be effected; and if ſuppuration has taken place, I ſhould very much doubt the probability of ſucceſs, and an attempt might now poſſibly only retard the ſuppuration, and protract the cure.

"The reſolution of thoſe inflammations depends principally upon mercury, and almoſt abſolutely upon the quantity that can be made to paſs through them; and the cure of them, if allowed to come to ſuppuration, depends upon the ſame circumſtances. The quantity of mercury that can be made to paſs through a bubo, depends principally upon the quantity of external ſurface for abſorption beyond the bubo.

"Mercury is to be applied in the moſt advantageous manner, that is, to thoſe ſurfaces by an abſorption from which it may paſs through the diſeaſed gland; for by deſtroying the diſeaſe there the conſtitution has leſs chance of being contaminated. The powers of mercury may often be increaſed from the manner in which it is applied. In the cure of buboes it ſhould always be made to paſs into the conſtitution by the ſame way through which the habit received the poiſon; and therefore to effect this, it muſt be applied to the mouths of thoſe lymphatics which paſs through the diſeaſed part, and which will always be placed on a ſurface beyond the diſeaſe.

"But the ſituation of many buboes is ſuch as not to have much ſurface beyond them, and thereby not to allow of a ſufficient quantity of mercury being taken in in this way; as for inſtance, thoſe buboes on the body of the penis ariſing from chancres on the glans or prepuce.

" Theſe two ſurfaces are not ſufficient to take in the neceſſary quantity to cure thoſe buboes in its paſſage through them; therefore whenever the firſt ſymptoms of a bubo appear, its ſituation is well to be conſidered, with a view to determine if there be a ſufficient ſurface to effect a cure, without having recourſe to other means. It is firſt to be obſerved, whether the abſorbent veſſels on the body of the penis are affected, or the glands in the groin.

" If the diſeaſe be in the groin, it muſt be obſerved in which of the three ſituations of the bubo before taken notice of, it is; whether on the upper part of the thigh and groin, on the lower part of the belly before Poupart's ligament, or near to the pubes. If they are on the body of the penis, this ſhews that the abſorbents leading directly from the ſurface of abſorption are themſelves diſeaſed. If in the groin, and on the upper part of the thigh, or perhaps a little lower down than what is commonly called the groin, then we may ſuppoſe it is in the glands common to the penis and thigh. If high up, or on the lower part of the belly, before Poupart's ligament, then it is to be ſuppoſed that thoſe abſorbents that ariſe from about the groin, lower part of the belly and pubes, paſs through the bubo; and if far forwards, then it is moſt probable that only the abſorbents of the penis and ſkin about the pubes paſs that way. The knowledge of theſe ſituations is very neceſſary for the application of mercury for the cure by reſolution, and for the cure after ſuppuration has taken place.

" The propriety of this practice muſt appear at once, when we conſider that the medicine cannot paſs to the common circulation without going through the diſeaſed parts; and it muſt promote the cure in its paſſage through them; while at the ſame time it prevents the matter which has already paſſed, and is ſtill continuing to paſs into the conſtitution from acting there, ſo that the bubo is cured and the conſtitution preſerved.

" But this practice alone is not always ſufficient, there are many caſes which mercury by itſelf cannot cure. Mercury can only cure the ſpecific diſpoſition of the inflammation; and we know that this diſeaſe is often attended with other kinds of inflammation beſides the venereal.

" Sometimes the common inflammation is carried to a great height, at other times the inflammation is eriſypelateus, and I ſuſpect often ſcrofulous. We muſt therefore have recourſe to other methods.

" Where the inflammation riſes very high, *bleeding*, *purging*, and *fomenting*, are generally recommended. Theſe will certainly leſſen the active power of the veſſels, and render the inflammation more languid, but they can never leſſen the ſpecific effects of this poiſon, which were the firſt cauſe, and are ſtill in ſome degree the ſupport of the inflammation. Their effects are only ſecondary;

and if they reduce the inflammation within the bounds of the ſpecific, it is all the ſervice they can perform. If the inflammation be of the eryſipelatous kind, perhaps bark is the beſt medicine that can be given; or if it be ſuſpected to be ſcrofulous, hemlock, and poultices made with ſea-water, may be of ſervice.

"*Vomits* have been of ſervice in reſolving buboes, even after matter has been formed in them, and after they have been nearly ready to burſt; this acts upon the principle of one irritation deſtroying another; and the act of ſickneſs and vomiting perhaps gives a diſpoſition for abſorption."

Mr. Hunter mentions a remarkable inſtance of the removal of a bubo though ready to burſt, merely by ſea ſickneſs. This happened to an officer at Liſbon, and when the ſickneſs went off, he found the bubo was entirely gone, and it never afterwards troubled him.

The *reſolution of the inflammation of the abſorbents of the penis*, Mr. Hunter ſays is to be attempted in both ſexes by the uſe of mercury, topically and generally. This he ſays is neceſſary to prevent the lues venerea, as well as to cure the parts themſelves. As to the quantity it muſt be left to the ſurgeon, who muſt be guided by the ſigns of the original complaint, and the readineſs with which the ſymptoms have already given way.

In attempting the *reſolution of buboes in the groin*, Mr. Hunter ſays,

"It will be proper to apply the mercury according to the ſituation of the inflamed gland. If the bubo be in the groin, according to our firſt ſituation, then it is neceſſary to rub the mercurial ointment upon the thigh. This ſurface will in general abſorb as much mercury as will be ſufficient to reſolve the bubo, and to preſerve the conſtitution from being contaminated by the poiſon that may get into it; but if reſolution does not readily take place, then the ſurface of friction may be increaſed, by rubbing the ointment upon the leg.

"But if the bubo be on the lower part of the belly, that is, in the ſecond ſituation, then the ointment ſhould be rubbed alſo upon the penis, ſcrotum, and belly; and the ſame if the bubo ſhould be ſtill further forwards; for probably thoſe glands receive the lymphatics from all the ſurfaces mentioned, as well as from the thigh and leg.

"The length of time the frictions ſhould be continued, muſt be according to circumſtances. If the bubo gives way, they muſt be continued till it has entirely ſubſided, and perhaps longer, on account of the cauſe of it, a chancre, which may not yield ſo ſoon as the bubo. If it ſtill goes on to ſuppuration, the frictions may or may not be continued; for I do not know for certain if anything is to be gained by their continuance in this ſtate."

If the quantity of mercury uſed affect the mouth, its further uſe muſt be regulated accordingly. Mr. Hunter deſcribes the treatment of *buboes in other parts*, in the following way:

"As venereal buboes," ſays he, "ariſe from other modes of application of the poiſon beſides coition, they are to be found in different parts of the body; but the hands appear to be the next in order of frequency. They ariſe in the arm-pit from wounds in the hands or fingers being contaminated by venereal matter, and reduced to a chancre. In ſuch caſes it becomes neceſſary that the ointment ſhould be rubbed on the arm and fore-arm; but this ſurface may not be ſufficient, therefore we muſt apply it in another way, or to other parts, to produce its effects upon the conſtitution.

"I have ſeen a true venereal chancre on the middle of the lower lip produce a bubo on each ſide of the neck under the lower jaw, juſt upon the maxillary gland. By applying ſtrong mercurial ointment to the under lip, chin, and ſwellings, they were reſolved.

"The *quantity of mercury neceſſary* for the reſolution of a bubo muſt be proportioned to the obſtinacy of the bubo, ſtopping ſhort of certain effects upon the conſtitution. If it be in the firſt ſituation, and yields readily upon rubbing in half a drachm of mercurial ointment made of equal parts of quickſilver and hog's lard every night, and the mouth does not become ſore, or at moſt only tender, then purſuing this courſe till the gland is reduced to its natural ſize will be ſufficient, and probably will be a good ſecurity for the conſtitution, provided the chancre, which may have been the cauſe of the bubo, heals at the ſame time. If the mouth is not affected in ſix or eight days, and the gland does not readily reſolve, then two ſcruples, or a drachm, may be rubbed in every night; and if there be no amendment, then more muſt be rubbed in; in ſhort, if the reduction is obſtinate, the mercury muſt be puſhed as far as can be done without producing a ſalivation.

"If there be a bubo on each ſide, then there cannot be ſo much mercury applied locally to each; for the conſtitution moſt probably could not bear double the quantity which is neceſſary for the reſolution of one. But in ſuch caſes we muſt not ſo much mind the ſoreneſs of the mouth as when there is but one; however, the buboes muſt be allowed to go on to ſuppuration, rather than affect the conſtitution too much by the quantity of mercury; and therefore when there are two they are more likely to ſuppurate then where there is only one.

"In the ſecond or third ſituation of buboes, if we find that moſt probably a ſufficient quantity of mercury does not paſs through them for their reſolution, it may be continued to be thrown in by the leg and thigh to act upon the conſtitution, as has been already obſerved. The quantity taken in in this way muſt be greater than what

would be neceſſary if the whole could be made to paſs through the bubo. The mouth muſt be affected, and that in proportion to the ſtate and progreſs of the bubo.

"This method of reſolving buboes occurred to me at Belliſle, in the year 1761, where I had good opportunities of trying it upon the ſoldiers; and I can ſay with truth, that only three buboes have ſuppurated under my care ſince that time, and two of theſe were in one perſon, where a ſmall quantity of mercury had conſiderable effects on the conſtitution, and therefore a ſufficient quantity could not be ſent through the two groins for their reſolution; but in both caſes the ſuppurations were ſmall in compariſon to what they threatened to be, which I imputed to the mode of treatment.

"Many buboes after every attempt remain ſwelled without either coming to reſolution or ſuppuration, but rather become harder and ſchirrous. Such I apprehend were either ſcrofulous at firſt, or became ſo when the venereal diſpoſition was removed. The cure of them ſhould be attempted by hemlock, ſea-water poultices, and ſea-bathing, as will be further taken notice of."

In the treatment of buboes when they ſuppurate, Mr. Hunter introduces ſome new and important practical remarks. He ſays,

"After every known method has been uſed, buboes cannot in all caſes be reſolved, but will come to ſuppuration. They then become more an object of ſurgery, and are to be treated in ſome reſpects like any other abſceſs. If it be thought proper to open a bubo, it ſhould be allowed to go on thinning the parts as much as poſſible. The great advantage ariſing from this is, that theſe parts having become very thin, loſe the diſpoſition to heal, which gives the bottom of the abſceſs a better chance of healing along with the ſuperficial parts; by this means too, a large opening is avoided, and the different modes made uſe of for keeping the ſkin from healing till the bottom is healed, become unneceſſary.

"It may admit of diſpute, *whether the application of mercury ſhould be continued or not through the whole ſuppuration.* I ſhould be inclined to continue it, but in a ſmaller quantity; for although the parts cannot ſet about a cure till opened, yet I do imagine that they may be better diſpoſed to it; and I think that I have ſeen caſes where ſuppuration took place although under the above practice, that were very large in their inflammation, but very ſmall in their ſuppuration, which I imputed to the party's having taken mercury in the before-mentioned way, both before and while ſuppuration was going on.

"It has been diſputed more in this kind of abſceſs than in others, whether it ſhould be opened or allowed to burſt of itſelf; and likewiſe whether the opening ſhould be made by inciſion or cauſtic.

"There appears to be nothing in a venereal abſceſs different

from any other to recommend one practice more than another. The ſurgeon ſhould in ſome degree be guided by the patient."

Mr. Hunter ſays he once opened two buboes in the ſame perſon, one immediately after the other. The firſt was with the lapis infernalis, which gave him conſiderable pain, and therefore he would have the other opened with a lancet, as the pain would only be momentary. But it was ſo great, and the ſoreneſs continued ſo long, while there was no pain in the other deadened by the cauſtic, after it had done its buſineſs, that next day he ſaid if he was ever obliged to have one opened again it ſhould be with cauſtic. There can be no doubt, indeed, of the preference due to the latter method.

"The conſtitution at the ſame time is to be attacked with mercury, either by applying it internally or externally; if the mercury is applied externally, it ſhould be applied to that ſide, and beyond where the bubo is, as before directed in treating of the reſolution of buboes, as it may have ſome influence on the diſeaſe in its paſſing through the part.

"Giving mercury in theſe caſes anſwers two purpoſes, it aſſiſts the external applications to cure the buboes, and it prevents the effects of the conſtant abſorption of the venereal matter from the ſore.

"How far it is neceſſary to purſue the mercurial courſe *with a view to prevention* it is not poſſible to determine, but it may be ſuppoſed that it is neceſſary to give the ſame quantity to prevent a diſeaſe that would cure one that has already taken place. It will be neceſſary to continue the courſe till the bubo is healed, or till it has for ſome time loſt its venereal appearance; but it may be difficult to aſcertain this laſt fact; therefore we muſt have recourſe to experience, not theory, and continue the courſe in general till the whole is healed, and even longer, eſpecially if the bubo heals very readily; for we find in many caſes that the conſtitution ſhall be ſtill tainted after all; however ſome reſtrictions are to be made here, for I have already obſerved, that it often happens that buboes aſſume other diſpoſitions beſides the venereal, which mercury cannot cure, but will even make worſe. It is therefore very neceſſary to aſcertain the diſtinction; which will be taken notice of."

After obſerving that the treatment of ſuppurating buboes in the other ſex is the ſame as in men, the author makes ſome ingenious remarks on ſome of the *conſequences which buboes may occaſion*. Having formerly obſerved that the venereal diſeaſe was capable of bringing latent diſpoſitions or ſuſceptibilities into action, Mr. Hunter ſays, "this is remarkably the caſe with buboes, and I believe the diſpoſition is more of the ſcrofulous kind than any other; whether this ariſes from the buboes being formed in lymphatic glands, or not, is probably not eaſily determined.

"It sometimes happens that these sores when losing, or entirely deprived of, the venereal disposition, form into a sore of another kind, and most probably of various kinds. How far it is a disease arising from a venereal taint, and the effects of a mercurial course jointly, is not certain, but most probably these two have some share in forming the disease. If this idea of it were just, it would become a specific disease and be reducible to one method of cure; but I should suspect that either the constitution or the part hath some, if not the principal, share in it; that is, the parts fall into a peculiar disease independent of the constitutional disease or method of cure; for if it arose out of the two first entirely, we might expect to meet with it oftener. So far as the constitution or the part has a share in forming this disease, it becomes more uncertain what the disease is, because it must in some degree partake of the constitution or nature of the part. I am apt to suspect something scrofulous in them, especially as they are diseases of the lymphatic glands.

"Such diseases make the cure of the venereal much more uncertain, because when the sore becomes stationary, or the mercury begins to disagree, we are ready to suspect that the virus is gone, but this is not always the case; the virus is perhaps only less powerful than the new-formed disease, and as it were lies dormant, or ceases to act, and when the other becomes weaker, the venereal begins to shew itself again."

Mr. Hunter says, the treatment in such cases is, to attack the predominant disease, but still the difficulty is to find out the disease, and whether it is or is not venereal. He relates the following case with a view to exhibit this difficulty:

"A gentleman had a very large venereal bubo: it was opened; he took a great deal of mercury for about two months, but I suspect not in sufficient doses, which produced a mercurial habit; the bubo had no disposition to heal, and he came to me. From the account he gave me, I suspected that he had then too much of a mercurial habit to receive at this time any further good from that medicine, I therefore advised him to use a good nourishing diet for near a month; after that I put him upon a brisk mercurial course by friction, and the parts put on a better appearance. This course he continued for near two months, and then the sore, although much mended, began to be stationary. I did now conceive that the venereal action was destroyed, and therefore immediately left off the mercurial course and put him upon a milk diet, and sent him into the country. But not gaining much ground, he had a strong decoction of the sarsaparilla with mezereon given him, which although continued for above a month produced little or no effect. I also gave him the cicuta as much as he could bear, with the bark almost the whole time, without effect; new sinuses formed which were opened, and the sore be-

came extremely irritable, with thickened lips. The dreſſings were poultices made with the juice of hemlock, ſea-water, opium, and a gentle ſolution of lunar cauſtic; but nothing ſeemed to affect it. I ſuſpected ſomething ſcrofulous, therefore propoſed he ſhould go and bathe in the ſea, but this then could not be done. Theſe different treatments after mercury had been left off took up about four months without the leaſt benefit. Being doubtful whether there might not be ſtill ſomething venereal in the ſore, eſpecially as appearances were growing worſe, and it was now four months ſince he had taken any mercury, I was inclined to try it once more, and ſent him two portions of ointment, half an ounce each, to rub in in two nights. He had caught a little cold, and therefore did not rub in the mercury the two evenings as ordered; and called upon me the third day and told me he was much better; the ſore now became eaſy, the watry or tranſparent inflammation began to ſubſide, the lips became flatter and thinner, and the edges of the ſore began to heal. I then deſired him not to rub in the ointment, but wait a little. In eight or ten days the ſore had contracted to three quarters of its former ſize, and had all the appearance of a healing ſore.

"What concluſions," ſays Mr. Hunter, "ſhould we draw from this caſe? I think the following; that the virus may be gone although the ſore has no diſpoſition to heal, therefore we are not to look upon the not healing of a bubo as a ſign of the preſence of the original diſeaſe. Secondly; that the ſarſaparilla, mezereon, cicuta, and the bark, will not do in all ſuch caſes; and thirdly, that ſome of theſe diſeaſes are capable of wearing out the unhealthy diſpoſition of themſelves, and that we ſhould not be too ready to attribute cures to our treatment; for if the mercury had been rubbed in, and the ſame effects had ſtill taken place, I ſhould then have certainly purſued the mercury with vigor, and attributed the cure to it; but I ſhould not have reſted here, I ſhould have related the caſe as an inſtance of the diſeaſe continuing after repeated courſes of mercury, and that it was neceſſary in ſuch caſes where the mercury appeared to loſe its power, and even do harm, to wait, and ſeaſon the conſtitution to ſtrength and the loſs of the mercurial habit; and that even four months was ſometimes neceſſary for this purpoſe; after which we muſt begin again to give mercury.

"A gentleman had a common gonorrhœa which was ſevere, I gave him an injection of a grain of corroſive ſublimate in eight ounces of water, with a few mercurial pills. After having continued the injection for ten or twelve days without any viſible benefit, I gave it as my opinion that it would be of no ſervice to continue it any longer, and therefore deſired he would be quiet for a little time. About this time a ſwelling in each groin took

place, and ſuppoſing them to be venereal, I ordered mercurial ointment to be rubbed into both the legs and thighs to reſolve them if poſſible. He appeared to be leſs uneaſy about the buboes than he was about the gonorrhœa; but I told him that the cure of that complaint would be inſenſibly involved in the reſolution of the buboes. I ſpoke too confidently of my powers of the reſolution of the buboes, for they both ſuppurated; although the ſuppuration was ſmall in compariſon to the magnitude of the buboes when they firſt inflamed. The frictions were left off.

"While we were attempting to reſolve the buboes he got well of the gonorrhœa. The ſkin covering the buboes became thin, they were both opened, one with a cauſtic, the other with a lancet; when opened, he was ordered to rub in mercury again on the thighs and legs for their cure. They began ſoon to look well, and to cloſe faſt, but when about half healed they became ſtationary. I ſuſpected that a new diſeaſe was forming. On continuing the frictions a little longer they began to inflame and ſwell anew, and a ſuppuration took place about half an inch above each of the firſt ſuppurations, which broke into the firſt. I left off the mercury immediately upon their inflaming, and ſaid that now a new diſeaſe had formed. I ordered poultices made with ſea-water to be applied, and alſo a decoction of ſarſaparilla to be taken, but this appeared not to be ſufficient for the cure of this new diſeaſe. I then ordered him to the ſea, and to go into the tepid ſea-bath every evening, the heat of the water to be about ninety degrees. By the time he had been in the bath four times, the inflammation and ſwelling had very much abated, and the firſt ſores, or original buboes, were beginning to heal. He went on with the bathing every evening for about three weeks, when the ſores rather began to look worſe; I then ſuſpected that the venereal diſpoſition was become predominant, and I ordered him to rub in as before, which he did, and in about a fortnight the firſt buboes healed, but the ſecond ſuppurations were not yet healed; then I ſuppoſed it to be entirely the new-formed diſeaſe, and he went into the country, where I deſired he might go into the open ſea every day, as he then could have an opportunity, which he did, and got perfectly well, and has continued ſo."

In Mr. Hunter's opinion, this caſe ſhews that there was *another diſpoſition* formed beſides the venereal, and which was put into action by the venereal irritation, which he ſuſpects was of a *ſcrofulous* kind, and probably not purely of that nature.

"I have ſeen ſome buboes" ſays he, "moſt extremely painful and tender to almoſt every thing that touched them, and the more mild the dreſſings that were applied, the more painful the parts became.

"In ſome the ſkin ſeems only to take on the diſeaſe. Ulcera-

tion going on in the ſurrounding ſkin, while a new ſkin forms in the centre and keeps pace with the ulceration, forming an irregular ſore like a worm-eaten groove all round. This, like the erysipelatous inflammation, as alſo ſome others, appears to have only the power of contaminating the parts that have not yet come into action; and thoſe that have already taken it ſeem to loſe the diſeaſed diſpoſition, and heal readily."

In ſome inſtances, it is added, they ſpread to an amazing extent, as proved to be the caſe in the following remarkable account of a fatal doſe of hemlock.

"A young gentleman, aged eighteen years, in conſequence of a venereal infection had two buboes, which were both opened. They were treated in the uſual manner, and at firſt put on a favourable appearance; but when they were nearly healed they began to ulcerate at their edges and ſpread in all directions, riſing above the pubes almoſt to the navel, and deſcending upon each thigh. His nights became reſtleſs, and his general health was affected. A great variety of medicines were tried, particularly mercury in different forms, with little or no effect. Extract of hemlock did more good than any thing elſe, and was taken in unuſual quantities. An ounce was ſwallowed in the courſe of the day for ſome time, which was afterwards increaſed to an ounce and an half, two ounces, and even two ounces and an half. It produced indiſtinct viſion and blindneſs, loſs of the voice, falling of the lower jaw, a temporary palſy of the extremities, and once or twice a loſs of ſenſation; and notwithſtanding he was almoſt every night in a ſtate, as it were, of complete intoxication from the hemlock, his general health did not ſuffer, but on the contrary kept pace in its improvement with the ulcers. They could not however be healed by the hemlock; and among many other things, Æthiop's mineral and Plummer's pill were liberally given, ſeemingly with advantage. Recourſe was had to the hemlock from time to time. A great many different kinds of dreſſings were made trial of, none of which were found to exceed dry lint. The ulcers were nearly all healed, after having tormented him upwards of three years, when committing ſome irregularities in diet, and the ſores getting worſe, he returned to the extract of hemlock, which he had for ſome time laid aſide, and of himſelf ſwallowed in the courſe of the morning ten drams. This quantity was only the half of what he had formerly taken in twenty-four hours, but his conſtitution had been at that time gradually habituated to the medicine. The ten drams produced great reſtleſſneſs and anxiety; he dropt inſenſible from his chair, fell into convulſions, and expired in two hours."

Our author, returning to the cure of buboes, ſays, where they only *become ſtationary*, and appear to have but little diſpoſition to ſpread, which is moſt common; and perhaps a ſinus or two run-

ning into them from some other gland, they give way to hemlock sooner than to any thing, and especially if joined to the bark. The former should be applied both internally and externally. He adds, that *sarsaparilla* is often of the greatest service here; sea-bathing also, and the sea-water poultice.

At the Lock hospital they use *gold-refiners' water* topically; and it is of service in some cases. Dr. Fordyce recommends the juice of oranges to be drank in large quantities, which Mr. Hunter says he has seen good effects from, and also from the mezereon.

Sect. IV. Lumbar Abscess.

The term *lumbar* may be applied to every abscess seated in the loins; but that which is here meant is such as begins about the top of the os sacrum, and is seated in the vicinity of the great psoas muscle.

The symptoms begin with pain and tension about the loins, shooting upwards to the spine and downwards to the thigh. The disease has sometimes a strong resemblance to nephritic affections, and is sometimes mistaken for lumbago. After suppuration takes place, shivering fits come on; and the pain now becoming dull, the patient imagines himself better till matter points at the side of the anus, or in the groin. The first case is rare; and when it does occur, the tumor bursts, or is opened as a common abscess. In the other case, the matter is seated behind the fascia of the groin, and sometimes descends as far as the knee. The teguments commonly retain their natural appearance. Fluctuation is evident, especially when the patient is in an upright posture. It is often mistaken for crural hernia; but may be easily distinguished from it, by its slow progress, by pain in the lumbar region at the commencement of the disease, by the patient allowing the tumor to be handled freely, by fluctuation being evident, by the tumor becoming flaccid when the patient is in an horizontal situation, and by the absence of all the symptoms by which hernia is distinguished. Both diseases may occur at once; but this is very rare, and a distinction is still to be made.

It is discovered that this disease has, in general, been induced by considerable injury being done to the small of the back or loins, either by twists, or severe bruises, or by sudden exposure to cold after the heat occasioned by severe exercise, particularly in scrofulous habits. Were accidents of this nature immediately treated with that attention which their importance deserves, the disease might frequently be prevented.

In the treatment, the strictest antiphlogistic regimen is to be observed. Blood-letting ought immediately to be performed, by scarifying deeply and leeching the injured part: neither are blisters,

opiates, gentle purgatives, and other remedies uſeful in inflammations, to be neglected.

Authors have an idea that little advantage can be derived from laying open the abſceſs, on account of the great danger which may enſue from the admiſſion of air. Mr. Benjamin Bell, however, is of an oppoſite opinion, and has always given vent to matter here as elſewhere, and no bad conſequences have been obſerved. The matter, when long lodged, has been found to deſtroy the ſoft parts and bones, and ſometimes to make its way into the cavity of the abdomen; all of which might be prevented by an early evacuation. For this purpoſe a trocar ſhould be uſed, which was tried by Mr. Bell in one caſe with complete ſucceſs.

Some other caſes are lately narrated by authors, where, by the introduction of a ſeton, and drawing off the matter by ſlow degrees, and then by uſing compreſs, and ſometimes injections of gently irritating fluids, a cure has been performed in the courſe of a few months. If the caſe is doubtful, an opening ſhould be made with the knife in the ſame manner as in hernia. If the flow of matter continue conſiderable for the ſpace of two or three weeks, injections of a weak ſolution of ceruſſa acetata, lime-water, or other gentle aſtringents, may be employed.

Mr. Juſtamond, who had abundant experience of theſe important caſes, ſays this abſceſs is called, improperly, the *Pſoas* abſceſs; and that, in fact, it is originally, and in almoſt all inſtances, a *caries and conſequent abſceſs of the vetebræ of the loins*. He therefore terms it the *lumbar* abſceſs, which indeed is now the moſt received name for the diſeaſe.

"This abſceſs," ſays he, "manifeſts itſelf either by a tumor on the inſide of the thigh under Poupart's ligament, or externally on the ſide of the foramen magnum Iſchii, but much more frequently in the former place. This is the ſtate in which we generally ſee this deplorable diſeaſe, which, in the ordinary mode of treatment, is moſt commonly fatal. It is wonderful to obſerve from what apparently trifling beginnings this diſeaſe frequently originates. It is very often the effect of a counter-ſtroke received by a fall on the nates, or a violent ſhock on the feet in jumping, in which caſe, the vetebræ of the loins are the parts on which the ſhock muſt neceſſarily fall; and the diſeaſe is ſo ſlow and ſo inſenſible, as it were, in its progreſs, that it is only from very attentive experience we can be able to diſcover its tendency.

"It is upon this ground, that I would propoſe the probable means of *ſtopping its progreſs*, if we are happy enough to diſcover it in the firſt inſtance, and the beſt mode of treating it when it is far advanced. In order to make the whole of my doctrine, upon this important point, evident, let me trace the progreſs of the diſeaſe from the beginning, and ſhew the effects which attend

the uſual mode of treating it. In a ſhort time after ſuch ſhocks as I have been deſcribing, as alſo after violent and painful efforts to raiſe too heavy loads, the perſons who have been expoſed to theſe accidents complain of a dull pain in the region of the loins, accompanied with a difficulty in walking, or a lameneſs and hitch in the gait. Theſe complaints increaſing gradually, without ever cauſing any very acute pain, end at length in ſo great a debility of the ſpine, that the patients are no longer able to ſupport themſelves, but are obliged to keep in bed. The thigh in ſome inſtances grows waſted and extenuated, and a pain is felt from the loins to the inſide of the thigh, with a ſoreneſs to the touch, preciſely in the direction of the tendons of the pſoas and iliacus internus muſcles, where the matter is probably attempting to paſs.

"At this period, which is at the diſtance of from ſix, to nine, ten, or more months after the accident, we generally begin to perceive a tumor, which moſt commonly makes it appearance, as we before obſerved, on the inſide of the thigh, juſt below Poupart's ligament, and which increaſes ſlowly, without being painful to the touch. When the tumor has acquired a certain ſize, and the matter which forms it is ſufficiently advanced towards the ſkin, a manifeſt fluctuation is obſerved in it, which ſeems to furniſh a poſitive indication for the opening of it.

"The ſurgeon therefore thinks himſelf obliged to open the tumor, and this he generally does largely; and giving iſſue to a large quantity of matter, which has been confined for a long time, he now imagines that he muſt have contributed to the advantage of his patient. But let us trace the fatal change which ſoon takes place, and we ſhall be convinced of the contrary.

"The patient, who for ſome months paſt had experienced no evident degree of fever, who ſuffered but little, who had perhaps preſerved his appetite, who ſlept, and who had complained of no other ſymptom but that he could not keep his back upright, is far from being relieved by this operation; at leaſt if he be, the relief is not of long continuance; for the matter forming the tumor, which, at the time of the opening, was as white as milk and perfectly devoid of ſmell, ſoon contracts a conſiderable ſtench, and becomes intolerably offenſive; a fever comes on, the pulſe becomes quick and ſmall; in a word, a hectic ſupervenes, and the patient dies not unfrequently towards the thirteenth day. Sometimes indeed, patients in this diſeaſe may live longer, but they only drag on a miſerable exiſtence, and a fatal termination almoſt always ſucceeds.

"Upon opening the body after death, a caries of two or three of the lumbar vertebræ, and often of part of the os ſacrum, preſents itſelf to our view; and from ſeeing ſo much miſchief, the

ſurgeon is far from ſuſpecting that the diſſolution of the patient has been haſtened by his management.

" It is proper however to obſerve, that the patient had lived ſeveral months, without any conſiderable inconvenience, with this caries and this tumor. Though it contained a large collection of matter, his ſtate would not have been ſo ſuddenly changed, if an opening had not been too precipitately made. We ſhall be convinced of this by attending to what happens when theſe tumors are left to nature. If they burſt of themſelves, the opening is made much later, and in this caſe the matter preſerves its original mildneſs and inoffenſive ſmell much longer, or perhaps is never altered. If however it ſhould alter, it does not happen ſo ſoon as when the abſceſs has been opened; and though ſome alarming ſymptoms ſhould come on at this period of the burſting, they are much leſs rapid in their progreſs, and ſeldom riſe to ſuch a height as when the opening has been made by art.

" The reaſon of this ſeems to be, becauſe nature procures no more than a very ſmall iſſue to the matter, and that too in her own way, by which perhaps the eaſy introduction of atmoſpheric air into the centre of the cavity, where her operations are ſtill going on (and which in theſe caſes, ſeem particularly apt to be diſturbed), is greatly impeded. If the patients die too, when nature makes the opening, they periſh much later than in the other inſtance."

This difference in the event of the diſeaſe, and theſe ideas, which were firſt ſuggeſted to Mr. Juſtamond in a very ingenious performance on the ſubject of Motion and Reſt, by M. David, then ſurgeon of the *Hotel Dieu* at Rouen; taught him *never to meddle with lumbar abſceſſes*, nor to apply any thing to them that might tend to haſten their burſting. Whatever may be the ſize of the tumor, and however pointed the fluctuation from the matter endeavouring to form itſelf an iſſue, it was a rule with him never to employ a cutting inſtrument, nor to open them even by cauſtic.

" Out of four caſes," ſays he, " which I have treated within theſe four years, but *one* has proved unſucceſsful. One of theſe laſted for above two years; repeated openings formed in different parts of the thigh, both externally and internally, from which the patient ſuffered much at intervals, and was expoſed to ſome alarming ſymptoms. I was obliged to make uſe of all my perſuaſion, to prevail upon the mother of this child not to have any thing done, but to leave the whole to nature. I ſpoke ſo ſtrongly however, that ſhe at laſt complied with my wiſhes, and by obſerving to keep the patient as much as poſſible from motion, ſhe perfectly recovered from one of the worſt of theſe caſes I ever ſaw. Another inſtance is that of a young man, whoſe complaint alſo laſted a very long time. It was opened by nature, under

Poupart's ligament, and as there was a large quantity of matter continually attempting to burſt forth, yet unable to force its way through an opening ſo very ſmall (from which the patient ſuffered much pain), I introduced a ſmall piece of gentian root into the opening. He was relieved by this, and I had then an opportunity of injecting and cleanſing the cavity of the abſceſs with myrrh water; from which, in this long treatment, he experienced much advantage. At one period of the diſeaſe, there was ſo large a piece of exfoliated bone preſented itſelf at the orifice, that it was with much difficulty I could extract it, although the orifice was full large enough to admit my finger. This patient recovered perfectly, as indeed the viſible improvement of his health had previouſly indicated.

"The unſucceſsful caſe, out of the four inſtances I have mentioned, was one, where the tumor was external upon the buttock, and of an immenſe volume: and indeed I have in general obſerved, that thoſe lumbar abſceſſes which burſt in this way, are more certainly fatal than thoſe which burſt under Poupart's ligament.

"The alarming ſymptoms which patients experience in the courſe of this melancholy diſeaſe, whether it be treated by art, or left to nature, are of the feveriſh or hectic kind; and they uſually take place at different intervals, except where an artificial opening has accelerated the progreſs of the complaint. It is the buſineſs therefore of the ſurgeon, beſides preſcribing abſolute reſt, to underſtand what are the beſt means of counteracting theſe hectic paroxyſms when they affect the patient. The bark is uſually thought the beſt medicine in ſuch caſes, and indeed the adminiſtration of it ought not to be neglected, but we ſhall find its powers wonderfully aſſiſted by ordering the patient to take twice a-day, ten grains of powdered myrrh, with three grains of powdered rhubarb. The antiſeptic quality of this medicine will be found particularly uſeful in abating the violence of hectic ſymptoms.

"The neceſſity of ſuffering theſe abſceſſes to *burſt of themſelves* will farther appear from conſidering, that this ſpontaneous opening ſeems to be an extreme reſource of nature, to which ſhe is rather compelled from the incumbent weight of a great quantity of fluid. It ſhould ſeem to be a termination by no means conſonant to her wiſhes, ſince, whether it happens by her own proceſs or by art, it always excites alarming ſymptoms, though in a leſs degree in ſome inſtances than in others. But, before the period of burſting, no alarming ſymptoms of hectic, ſuch as happen afterwards, are obſerved; and the chief ſymptom then is debility and inability of motion, which naturally lead to the grand intention of cure, abſolute reſt.

"This I ſhall illuſtrate by two caſes, one recorded in the performance above mentioned, and the other ſupplied by my own practice.

CASE I. " ' A young woman of 22 years of age,' ſays M. David, ' having fallen down ſtairs, felt, for a conſiderable time, a pain, more or leſs acute, in the region of the loins, and was likewiſe gradually ſeized with a weakneſs in that part, which, in a ſhort time, prevented her from walking, and even from ſupporting herſelf. At this period of the diſeaſe ſhe applied to me. Revolving in my mind theſe ſymptoms and the cauſe that had produced them, I imagined her caſe to be a diſeaſe of the lumbar vertebræ, and the beſt means of cure that could be preſcribed, were reſt and lying in bed. I explained to her the imminent danger of her ſituation, and engaged her punctually to follow my advice. This ſhe did very exactly, by going to bed, and remaining there conſtantly, taking care to exert as little motion as poſſible, agreeably to what I had recommended. Notwithſtanding theſe precautions, the diſeaſe continued to advance. The weakneſs of the loins, and the pain ſhe felt there upon motion, were accompanied with a tumor which began to make its appearance under Poupart's ligament. This became, in proceſs of time, as large as one's fiſt; and at length manifeſted an evident fluctuation. Warned by the melancholy end of thoſe in whom ſuch tumors had been opened, I carefully avoided applying any thing that might haſten the burſting of it, and abſtained ſtill more religiouſly from opening it with a cutting inſtrument. This tumor with fluctuation, after having acquired its full ſize, remained nearly in the ſame ſtate during four months, and at that period began to be inſenſibly diſſipated; ſo that in four months after this, there remained not the leaſt veſtige of it. The patient felt, from one week to another, that the ſpine was recovering its former ſtrength; ſhe began to ſit upright in her bed, while her back was ſupported; ſhe then made a ſhift to walk with a ſtick; and was at length capable of walking alone, and unſupported, with as much firmneſs and confidence as ever. But this happy termination of the diſeaſe, was owing to her perſevering near a twelvemonth in keeping her bed, and in a ſtate of reſt.'

" This, it muſt be allowed, is a great leſſon in ſurgery, and one which the judicious obſerver will not fail to apply to practical advantage. It invites him to contemplate the courſe of nature, and teaches him to ſuſpend the uſual exertions of his art, whenever they are likely to diſturb her intentions. It ſhews him a large collection of matter, to the evacuation of which, in conformity to the moſt received and ſoundeſt principles of the ſcience, he would have proceeded, as ſoon as the fluctuation had been evident; apprehending, that a longer confinement would produce miſchief. Yet we ſee, that this ſame matter, after having been collected in a large quantity and in a diſtinct cavity for ſeveral months, was received again into the courſe of the circulation, without occaſioning the leaſt inconvenience; and that the principal diſeaſe produced by it, was cured without the aſſiſtance of art, otherwiſe than in enjoining the patient a long and perſevering abſtinence from motion.

"Let us now inveſtigate, and endeavour to explain, in what manner this great effect has been brought about. The diſeaſe exhibits to us, in the firſt inſtance, a diſturbance of the organization in the bodies of the lumbar vertebræ, by means of a ſhock conveyed to them, or a forcible divulſion of the ligaments that unite them. The ſwelling of the parts being the conſequence of theſe firſt accidents, and a ſlow inflammation coming on, this at length cauſes a ſuppuration, and an abſceſs, which forms in the neighbourhood of the parts firſt affected.

"The organization of the bodies of the vertebræ being depraved, it follows, that ſmall ſeparations or ſcales muſt be thrown off from theſe bones; which circumſtance is accompliſhed as much by the organic action of the inflamed parts as by the matter they furniſh. The matter itſelf, after having been efficaciouſly employed in ſeparating the corrupted from the ſound parts, is alſo the medium or agent to which nature intruſts the care of expelling and carrying them out; but this purpoſe is effected very ſlowly. Bony fragments, of greater or leſs dimenſions, being detached by means of the matter, float in that liquid, to which they preſent a greater extent of ſurface, in proportion as they are more divided. The pus itſelf in which they are ſteeped, becomes a menſtruum proper to diſſolve them, and its quantity increaſing in proportion to the continuance and extent of the ſuppuration that ſeparates the looſe piece of bone, it at length makes a paſſage for itſelf towards the depending parts, and thoſe which afford the leaſt reſiſtance.

"But the matter, ſtill ſheltered from the external air, and undergoing no change, produces no miſchief in the parts that contain it. The fragments of bone which float in this quantity of pus, may at length be totally diſſolved in it, ſo as to form an homogeneous maſs, which perhaps may not then in any wiſe differ from our moſt elaborate nutritive juices. This being premiſed, we need not be aſtoniſhed, if nature, after having, at this period, employed the pus as a menſtruum to diſſolve the bony fragments to the ſeparation of which it has contributed, ſhould reſume it into the general courſe of the circulation, by taking it up from its cavity, through the means of the ſeveral abſorbent openings on the ſurface of that cavity. The return of the matter being then effected as ſlowly as its collection was formed, the parts which compoſe the cavity muſt return to their proper ſtate, as gradually as they were diſturbed from it, without accident and without inconvenience.

"With reſpect to the bones that are primarily affected, and which have almoſt adopted the nature of fleſh, during the long and important proceſs of exfoliation, no ſooner are they diſengaged from theſe looſe pieces than they begin to recover their ſolidity; and if ſeveral vertebræ, for inſtance, have partaken of the injury, they form among themſelves a common maſs of oſſification that in ſome meaſure ſup-

plies their bodies, and terminates this great caſe, which, as we have obſerved, can only be the work of nature, time, and reſt.

" The infinite importance, as well as novelty, of theſe doctrines, induces me to confirm them ſtill more by an account of the caſe before alluded to, which happened under my own obſervation at the Weſtminſter hoſpital. I never could account ſatisfactorily to my own mind for the cure of this caſe; and in the conducting of it, I candidly acknowledge, that I was far from being guided by thoſe great and new ideas of my friend concerning reſt, which I have ſince adopted with ſo much advantage.

Case II. " A young woman, ſeemingly healthy in other reſpects, came to the Weſtminſter hoſpital, with a tumor nearly as big as two fiſts, on the upper part and towards the inſide of the thigh. There was not the leaſt diſcolouration of the ſkin, nor any fluctuation. It was however the opinion of all the ſurgeons preſent, that it contained ſome fluid, and that there was an abſceſs ſeated underneath the faſcia, which time would bring forward. Though there was ſome pain attending this tumor, yet that was inconſiderable, and the patient was rendered unable to walk about with it, rather by debility than any other apparent cauſe. Though the ſwelling was ſomewhat lower than the ſpot where the lumbar abſceſs uſually makes its appearance, yet, for my own part, I could not help ſuſpecting the caſe to be of that kind, more eſpecially as it was accompanied with ſome pain in the loins. I cannot indeed even now take upon me to ſay that it was ſo. The fact is, however, that the tumor remained for ſix weeks or two months exactly in the ſame ſtate, the patient keeping her bed conſtantly, not indeed from any direction of mine, but merely from her inability to motion.

" There ſeemed a ſmall diminution of the bulk of the ſwelling, and as it was then likely that it might be diſperſed, and no apparent reaſon againſt this termination, I endeavoured by outward applications to forward what now appeared to me to be the intention of nature. I therefore cauſed ſome compreſſes, dipped in ſpirits of wine and camphor, to be applied to the ſwelling, and directed theſe to be maintained by a pretty long bandage rolled moderately tight on the ſwelling, and on the whole limb. By this method, and by the patient's continuing ſtill in bed for a time, I had the ſatisfaction to ſee this large tumor gradually diſappear. It was entirely gone, in about five months after her admiſſion into the hoſpital, and the limb was reſtored to its natural firmneſs; ſo that the patient went out perfectly cured of a complaint, the true nature of which had never been known, but which from its ſize, ſituation, and the debility attending it, ſeemed to threaten a much leſs favourable iſſue, than that which was thus fortunately brought about. It is probable that this caſe was of the ſame nature as that of the young woman quoted from the fore-mentioned eſſay, but not ſo far advanced; and we may preſume

that reſt was, in this inſtance alſo, the principal agent that effected the cure."

The generality of lumbar abſceſſes may be traced to the cauſes pointed out above; as well from the violence which the diſeaſed part may have immediately ſuffered, as perhaps from a determination of conſtitutional indiſpoſition thereto. This latter is more eſpecially the caſe in ſuch inſtances of the diſeaſe as have originated from very trivial accidents, and hence, in ſcrofulous habits, we may expect it to advance more rapidly.

Where, then, the firſt cauſe appears to have been a degree of violence which ſimply weakened the part, the mode of cure by long-continued reſt ſeems highly deſerving of our attention; but where there is likewiſe reaſon to apprehend the exiſtence of a ſpecific diſeaſe, the caſe certainly claims other aſſiſtances to diminiſh or counteract the force of theſe combined cauſes. Hence the exerting a different action, as near the part as poſſible externally, by means of ſetons, cauſtics, &c. promiſes to be attended with every advantage.

The early ſtage of this complaint may be remarked by a particular debility in the region of the loins, attended internally with ſome occaſional pains or uneaſineſs in the bowels near the ſame part. The motion of the thigh and leg on the affected ſide, is frequently impeded by a want of its uſual progreſſive power, particularly in walking over irregular ground, or going up and down ſtairs; to which we may add, an occaſional dragging of the limb, even over a level ſurface. The pulſe is in general quickened, and as the internal affection makes its progreſs, the glands in the groin of the affected ſide become enlarged in various degrees. When this latter appearance has exiſted for ſome little time, the upper part of the thigh is ſoon found to increaſe in ſize, particularly on the inſide; and in the courſe of a few weeks, a fluid may be more or leſs diſtinctly perceived. This is found to accumulate very faſt, and in proportion to the reſiſtance it meets with in the cellular membrane, becomes more or leſs confined, forming a projecting tumor anteriorly, or diffuſed, paſſes between the muſcles ſo as to bring on a general enlargement of the thigh; or forcing its way towards the nates, it has been known, on many occaſions, to burſt near the rectum, forming ſinuſes all round the lower part of the pelvis. In female caſes, it ſometimes eſcapes at the labia pudenda.

The invariable ill effect of *openings* made into theſe tumors to diſcharge the fluid, which is by much more frequently a kind of curds and whey, than a thick true pus (or, as has been ſtated, a fluid "*white as milk*"), are too well known to require any comment. We ſhall therefore forego any farther remarks, and introduce to the reader's notice a modern improvement of ſome conſequence in the treatment of lumbar abſceſſes.

Mr. Abernethy, one of the ſurgeons of St. Bartholomew's hoſpital, a few years ago, ſuggeſted a method of attempting the cure

of the lumbar abſceſs *by repeated diſcharges of the matter through a valvular puncture* made in the tumor. The trials made of this were flattering in many inſtances cited by the ingenious author at the time of publiſhing his firſt eſſay on the ſubject, and farther experience has, at leaſt, decided the propriety of adopting the practice he recommends in preference to any means before employed by ſurgeons.

The ſucceſs to be expected ariſes ſimply from the diſcharge of the matter, at different periods, by puncturing the tumor with a ſmall trochar, after having puſhed the lax ſkin upwards in ſuch a way that the orifice ſhall be completely cloſed on its returning to its natural ſituation. By this means the conſtitutional ſymptoms, heretofore ſo uniformly fatal in this diſeaſe, are avoided; and, if no caries of the bones, or other untoward circumſtance, has taken place, the patient's chance of a complete cure is conſiderable. From Mr. Abernethy's ſupplement to his eſſay on the lumbar abſceſs we ſelect the following caſes, which are the continuation of a *ſeries* produced in behalf of the operation recommended. The language of them will ſufficiently convey to the reader Mr. Abernethy's ideas concerning this diſeaſe, without any farther remarks on our part.

Case I. "This man, who was thirty-ſix years of age, and not unhealthy, had a lumbar abſceſs, which preſented beneath the faſcia of the thigh, and which there was no reaſon to ſuppoſe connected with any diſeaſe of the ſpine. From this abſceſs I diſcharged, by puncture, twenty-four ounces of healthy pus, and healed the orifice. The patient ſuffered ſome weakneſs and derangement of health, but they were not conſiderable. The operation was repeated every fortnight, and, by the fifth time of performing it, the quantity had decreaſed to four ounces. At the end of another fortnight, I made the opening to diſcharge the matter larger than common, and did not attempt to unite it, but directed a poultice to be applied to the thigh, and the patient to be kept in bed. No perceptible derangement in his health took place in conſequence of this. The lips of the wound granulated, which, I think, is always a good ſign; the faſcia ſeemed to adhere to the parts beneath, and, in the courſe of a month, he was thought well enough to leave the hoſpital, although there was ſtill ſome matter diſcharged from the wound. In a few weeks more, the part was entirely healed, nor had he afterwards any return of the complaint."

Case II. "—— Harris, thirty-five years of age, had a conſiderable collection of matter beneath the integuments of the abdomen, forming a moderately prominent tumor, about three inches in diameter, and ſeated juſt above Poupart's ligament. The patient had ſuffered a great deal from pain in his loins, and the motion of the thigh had been much impeded, but was now tolerably free. In-

deed there was no doubt that the matter had been originally formed in the loins, from whence it was violently impelled, so as to elevate the prominent integuments of the abdomen, whenever he coughed. By permission of Mr. Long, under whose care he was admitted into the hospital, I punctured the tumor, and discharged about twenty-four ounces of pus, mixed with some flakes of a curd-like substance. The wound healed readily, and no considerable alteration of his health ensued, though he found himself weaker for some days after the operation. At the end of a fortnight I made a second puncture, and let out between six and seven ounces of a turbid fluid. He now thought himself so much better than after the first evacuation, that he went out of the hospital, but returned again at the expiration of a fortnight, when, by a third puncture, six ounces of purulent matter were discharged, and, after another week, four ounces more were let out. A caustic was now applied to his loins, and four or five peas used to keep the ulcer open; from which time no matter could be discovered in the abscess during the six weeks that he remained in the hospital.

"About eighteen months after this he was admitted into the hospital on account of a fever and sore throat, and it appeared he had never experienced any farther complaint in his loins."

Mr. Abernethy conceives this case to be particularly interesting, inasmuch as it tends to prove that the cavity of the abscess may be entirely obliterated without the cyst undergoing any of those changes which generally happen in common cases, when it is exposed by an operation. He proceeds to relate,

Case III. "William Hankes, when about twenty-eight years of age, had a collection of matter formed in his loins, which descended beneath Poupart's ligament, and elevated the fascia of the thigh. The formation of this matter had not been attended with pain, neither were the motions of the thigh impeded during its collection. The elevated portion of the fascia was about three inches in length, and two in breadth; and the impulse communicated to it from the loins, on coughing, was distinct, though not very forcible. I punctured the abscess, and discharged twelve ounces of pus, in which there were some flakes of coagulum. The wound healed speedily, and the patient not only suffered no inconvenience, but even found himself better than before the operation. After three weeks' time, the matter which was collected gave so little prominence to the fascia, that, when I punctured it, I was apprehensive of injuring the subjacent parts; and not more than between five and six ounces of pus flowed from the orifice on this occasion. As the quantity of matter contained in the abscess at first was small, when compared with that in many other cases which terminated well, as the patient also was young, and apparently capable of sustaining the degree of irritation likely to ensue, I thought there was no great risk in leaving the orifice unclosed.

Accordingly, a poultice was applied over the part; and I hoped that, by thus endeavouring as much as poſſible to leſſen inflammation about the wound, I might prevent any conſiderable degree of it from taking place in the cyſt. For ſome time the faſcia felt ſore, and was painful when the integuments were preſſed; but this tenderneſs abated in about ten days; the diſcharge alſo leſſened, and there appeared ground to hope that the patient would ſoon get well. He was now attacked with pain in his loins, accompanied by fever; the diſcharge alſo increaſed, and had a fetid ſmell. Theſe ſymptoms, however, gradually abated, but left the patient greatly reduced in ſtrength. After a ſhort interval he again experienced a ſimilar relapſe and recovery, by which his weakneſs was ſtill farther increaſed. He had been occaſionally troubled with cough, which now became very conſtant, but without any expectoration; and I obſerved that he drew in very little air when he inſpired. As the abſceſs diſcharged largely, and the ſtrength of his conſtitution was rather declining, I made a large iſſue in the integuments of his loins, with a view to leſſen the internal diſeaſe. This ſeemed to be of great ſervice, for the pain of his loins went off, and the diſcharge from the abſceſs abated gradually, and at laſt became inconſiderable: ſtill, however, he did not recover his health, and the country air was now recommended by Dr. Latham, who had preſcribed for him, during his illneſs, thoſe medicines which his diſorder ſeemed to require. He accordingly left the hoſpital, and, at the end of ten months, returned to town, when the wound in his thigh ſtill continued to diſcharge a ſmall quantity of matter. Afterwards, a thickening of the integuments on the front of the thigh took place; and two or three ſmall ulcers formed there, which did not readily heal, but were ſometimes in a better, and ſometimes in a worſe ſtate. I ſaw him occaſionally, for two years, during which time he had tried the effect of ſea-bathing. His health, however, was not good, though it did not appear to me to ſuffer from the remains of the abſceſs, which neither occaſioned pain, nor hindered his walking. At laſt, his ſtrength declining, he was again admitted into the hoſpital, under Dr. Latham's care. He was now much troubled with cough and hectic fever; and, under the faſcia of the other thigh, oppoſite to the dorſum of the ilium, a freſh abſceſs appeared, which, however, had no communication with the abdomen. The powers of his conſtitution were now evidently broken, and he gradually ſunk, and died."

Mr. Abernethy's examination of this patient after death was very curſory. It appeared that both lobes of the lungs were irregularly and generally indurated, and that the cavity of the original abſceſs, though it ſtill remained open, was contracted into a narrow channel, leading from the thigh to the middle of the pſoas muſcle. "There was another large abſceſs on the oppoſite pſoas muſcle, which had not yet deſcended to the thigh, where, as has been

already mentioned, there was also an abscess of considerable magnitude, but unconnected with this in the loins. The lumbar vertebræ were perfectly sound.

"That the death of this man," continues the author, "was not owing to the original abscess in the loins, is to me very obvious. That abscess did, indeed, for a considerable time, greatly disturb his constitution; but it afterwards became indolent, and acquired a state incapable of exciting irritation. The derangement of health which he suffered was, I think, uncommon, and the disposition which different parts had to form matter was also unusually great.

Case IV. "Doods King, who was under the care of Mr. Blicke, was about thirty years of age, and of a very sickly aspect. The abscess presented beneath Poupart's ligament; it contained at first about twenty ounces of curdly matter, and was punctured four times, with the usual progressive reduction in the quantity of matter discharged; but before the fifth time of opening, one of the punctured places ulcerated. There was indeed, from the beginning, in this case, a great disposition in the skin to inflame and ulcerate, and it was with difficulty I could heal the orifices made to let the matter out. As soon as the cavity had thus become open, a poultice was applied to the part, and confinement to bed strictly enjoined. The patient became somewhat weaker, but no fever ensued. I did not suffer him to go about, however, for a long time, lest the motion of the parts should induce inflammation. The abscess at last became perfectly indolent itself, and un-irritating to the constitution, but it did not shew much disposition to heal. He was discharged in this state, and promised to apply again if his complaint became troublesome. I saw him about a month after his dismission, when he mentioned a design of going into the country; since which I have not heard of him.

Case V. "A poor girl, nineteen years of age, whose spine was greatly distorted from disease of the bodies of the vertebræ, had a collection of matter formed in her back, which made its way along the right psoas muscle, and now distended the fascia of the thigh so much, as to occasion a redness of the integuments, and a disposition in them to ulcerate. She was very thin, and of a delicate appearance, but her appetite was good, and her pulse, though frequent, was regular, and moderately strong. Issues were made in the integuments on each side of the curvature in the spine; and the abscess being punctured, two quarts of matter were discharged from it. At the end of a fortnight I let out another quart of a serous fluid, rendered turbid by pus. After a like interval, fourteen ounces, and again ten ounces, of a similar fluid, were evacuated. During all this time she suffered no derangement in her health; on the contrary, both her appetite and strength were increased; a convincing proof that it is not the quantity of matter

diſcharged, but the irritation which patients undergo in theſe caſes, that exhauſts their ſtrength. Indeed, whoever reflects upon the great loſs of nutritive matter which is often ſuſtained with little injury by delicate females, where the contents of a diſeaſed ovarium are frequently drawn off, will readily admit this concluſion.

"The patient now became rather feveriſh, her ſkin being hot and dry, and ſhe was thirſty and reſtleſs. At the end of the fortnight, the faſcia of the thigh was ſo little elevated, that it was difficult to puncture it, and ſix ounces of matter only were diſcharged. During the next fortnight her health improved, and ſhe daily went out into the air upon crutches, which the deformity of her ſpine had long obliged her to uſe. I now wiſhed her to return home, and to come to the hoſpital every fortnight or three weeks, as ſhe might find it neceſſary. Before her diſmiſſion, however, I once more punctured the faſcia, and let out ſix ounces of fluid. This was done on Saturday, and when I came to the hoſpital on Monday, I was not a little ſurpriſed to find the tumor in the thigh as large and tenſe as when I firſt ſaw it. The integuments were alſo affected with conſiderable eryſipelatous inflammation; her pulſe was a hundred and ſixty, and very irregular; her breathing quick, and ſo extremely difficult as to indicate ſome uncommon affection of the parts concerned in reſpiration; her face, too, expreſſed the greateſt diſquiet and alarm. All the account I could obtain from the patient was, that ſomething had burſt within her during the preceding night. She did not continue long in this diſtreſsful ſtate, but died before I came to the hoſpital next day."

On examining the body of this patient, it appeared that, in addition to the ſtate of ſome of the dorſal vertebræ, which were carious and deficient, expoſing the medulla ſpinalis; a large abſceſs had alſo formed beneath the pleura, on the left ſide of the ſpine. On this caſe, the fatal termination of which can be no matter of ſurpriſe, Mr. Abernethy obſerves, "It was now clear, that the abſceſs from which I had diſcharged the matter by puncture extended from the dorſal vertebræ to the thigh; but that a large abſceſs had alſo formed on the oppoſite ſide beneath the pleura, which forced its way through the carious ſpine, and again filled the cavity of the primary one. But why the mere burſting of this ſecond abſceſs, in the manner deſcribed, ſhould have occaſioned ſuch extraordinary derangement of the ſyſtem, and eſpecially ſuch difficult reſpiration, is not ſo eaſily explained."

Case VI. "James White, aged twenty-five years, came from Eſſex to be admitted into St. Bartholomew's hoſpital, on account of a lumbar abſceſs. He had ſuffered much from pain of his loins for twelve months, and for ſome time paſt had experienced a difficulty in lifting up his right thigh. There was a curvature in the dorſal vertebræ, but that, he informed me, was an old complaint;

yet, from the general appearance of the man, from the difficulty he had in moving the upper part of the trunk upon the lumbar vertebræ, and from the caution with which he attempted this motion, I could not but ſuſpect a diſeaſe of the ſpine. Iſſues were therefore made in the loins: and, on the 25th of June, I let out two quarts of purulent fluid from beneath the faſcia of the thigh. He had leſs pain in his back after the operation, and though he was teaſed with a cough his ſtrength did not ſuffer any diminution. On July 7th I diſcharged from the abſceſs fourteen ounces more of a turbid browniſh fluid. On the 17th, though the tumor in the thigh was inconſiderable, yet the part firſt punctured was elevated and inflamed. It ſeemed that the puncture in the integuments had healed, while that in the faſcia had not united firmly, but had ſuffered the matter to paſs through it, ſo as to elevate the ſkin. To remedy this, which threatened to lay open the cavity of the abſceſs, I was obliged to puncture it in another place, and eight ounces of fluid were diſcharged. The patient was now in much better health than he had been for more than a year, and was able to lift up his thigh without pain. I therefore ſet him to exerciſe the muſcles in the neighbourhood of the diſeaſe, thinking that if the exertion did not produce irritation, it might anſwer a good purpoſe. With this view he ſtood upon the leg of the ſound ſide, and alternately lifted up and let fall the other, until he was ſomewhat fatigued. By frequent repetition of this exerciſe, the muſcles of the diſeaſed ſide acquired conſiderable ſtrength, and in a little time he felt himſelf (to uſe his own expreſſion) 'able to go to plough.'

"The faſcia of the thigh was punctured every fortnight for ſome time, and afterwards every three weeks. When he had been nearly three months in the hoſpital, he became tired of the confinement, and feeling himſelf ſtrong, was very ſolicitous to have the abſceſs opened, and ſuffered to diſcharge itſelf. The diſeaſe of the ſpine made me unwilling to comply with his deſire, and I ſent him into the country for three weeks, that he might aſcertain, by the journey, whether he was as ſtrong as he ſuppoſed; thinking that, if he bore it without fatigue, it might be of ſervice to him. At the ſame time, I gave him ſtrict injunctions not to exert himſelf if his loins or thigh became painful; and, in that caſe, to return again by the firſt conveyance. It was five weeks, however, before he came back, when I found that the abſceſs had inflamed and burſt about twenty days after he left town; in conſequence of which he became ſo ill, that he could not bear removal. He was now in a moſt wretched condition, being ſcarcely able to turn in bed, from the weak and painful ſtate of his loins; his pulſe was rapid, and his ſkin hot, and he had occaſional fits of chilline ſs, ſucceeded by ſweating. He became conſiderably better, however, and continued ſo for ſome time, in conſequence of the attention paid to him in the hoſpital; but his health again declined; and,

after ſeveral relapſes, with intervals of temporary amendment, he at laſt ſunk, and died at the end of three months from his re-admiſſion."

On diſſection, Mr. Abernethy found that the abſceſs extended upwards, and was connected with ſome diſeaſed vertebræ. Theſe, however, did not appear in view on his lifting up the peritonæum, for the tendinous expanſion which covers their bodies was unbroken, and formed a kind of cyſt filled with matter, and with the fragments of three of the bodies of the lumbar vertebræ. This was evidently a peculiar caſe of diſeaſed ſpine, which nothing could remove, or be of ſervice to.

Case VII. "Robert May, aged thirty, was, about three years ago, attacked with ſevere pain in his loins, which has continued in a greater or leſs degree ſince that time. In the beginning of the winter the pain became very ſevere, during the continuance of which he was unable to lift up his thigh; and, ſoon after, he for the firſt time remarked a ſwelling in his groin. The pain then gradually abated, and he recovered the power of moving his thigh with tolerable freedom. About three months ago, he diſcovered another ſwelling beneath the glutæus muſcle of the ſame ſide. The ſwelling on the front of the thigh appeared large and ſpherical, and the matter was forcibly impelled from his loins whenever he coughed. The patient, who was of a pale complexion, with ſlender feeble muſcles, had alſo conſiderable difficulty in performing the natural motions of the ſpine; from which circumſtances, as well as from the long continuance of the diſeaſe, it ſeemed very probable that the vertebræ were affected."

The firſt time Mr. Abernethy punctured the abſceſs, about forty ounces of thin ſerous pus, mixed with ſome coagula, were evacuated. Three days after the operation, the patient had much pain in his back, on which account iſſues were made there, and gave ſome relief. The abſceſs was punctured ſix times, at intervals of a fortnight, till at laſt the quantity of matter diſcharged did not exceed five ounces. His health during this time became much better; but the repeated wounds made by the lancet produced a conſiderable degree of enlargement in the lymphatic glands on the front of the thigh. This, Mr. Abernethy ſays, had occurred to him in other caſes, but never in ſo great a degree. One of the largeſt of the glands ſuppurated and ulcerated, and the general tumor was ſo great, as to preclude any farther attempt to puncture the faſcia. "I was therefore," ſays the author, "obliged to have recourſe to other means, from one of which I experienced much advantage. Having applied leeches and aqua lithargyri acetati to the tumor, without any effect, I was induced to try emetics; one of which, conſiſting of half a drachm of *vitriolated zinc* and one grain of *vitriolated copper*, the patient took twice a-week. The uſe of theſe was followed by a great abatement in the ſwelling

of the glands; and no fluid was collected in the abſceſs for more than ſix weeks, although, during that time, theſe medicines were gradually left off.

"As I could now do no more for the patient, and thought that he would recover his health ſooner out of the houſe, he was made an out-patient. In little more than a fortnight, however, he returned. A new inflammation had attacked his loins, where, as it appeared, the diſeaſe had not abated ſufficiently to allow of much exertion in exerciſe. He was again admitted into the hoſpital, in hopes that this attack might ſubſide during a ſtate of reſt. Very unfortunately, however, the ulcerated gland partook of the general inflammation, and the ſore enlarged. A poultice was now applied over the front of the thigh; but, on the fourth day after his re-admiſſion, the ulceration extended into the cavity of the abſceſs; which circumſtance was known by the quantity of ſerous diſcharge that followed on the removal of the poultice; nearly a teacupful of this kind of fluid came away daily."

This caſe ended fatally as might be expected, but no opportunity offered of examining the body.

Case VIII. "Elizabeth Smyth, aged twenty-ſeven, had a lumbar abſceſs, which preſented beneath the faſcia of the thigh. The previous ſymptoms rendered the nature of the complaint indiſputable; and as ſhe not only ſhewed evident marks of a ſcrofulous habit, but alſo felt conſiderable inability in moving the ſpine, there was great reaſon to ſuſpect that the abſceſs originated from a diſeaſe in the bone. She was likewiſe troubled with cough, and drew in very little air when ſhe inſpired. Her appetite, too, was often deficient, and her bowels frequently diſordered. It may alſo be added, that her brother, who greatly reſembled her, was at this time a patient in the hoſpital, under Mr. Long, on account of a ſcrofulous diſeaſe of the ſpine, which had occaſioned an affection of the medulla ſpinalis. When all theſe circumſtances were taken into account, ſhe certainly appeared a ſubject by no means capable of ſuſtaining the irritation and diſorder which the burſting of a lumbar abſceſs might be expected to produce. I therefore punctured the abſceſs immediately, and diſcharged from it twenty ounces of flaky matter; and, having healed the wound, I gave her emetics of vitriolated zinc and copper, and afterwards of ipecacuanha, twice or three times a week, for ſix weeks. At the end of this time there was ſo little matter in the abſceſs, that I thought it too ſmall to be punctured with ſafety; and, as her health was too infirm to admit of the emetics being continued, I tried to produce abſorption of the remaining matter, by paſſing the electric fluid through the abſceſs. Very ſmall *electric ſhocks* were accordingly ſent from different parts, by the ſide of the lumbar vertebræ, down to the groin, and upper part of the affected thigh; and, under this treatment, the contents of the abſceſs ſoon diſappeared,

nor did any farther collection of matter take place during the time of her remaining in the houſe, which was nearly two months. The electricity alſo brought on the menſtrual diſcharge, which, for a long time, had been very irregular; and her general health was greatly improved before ſhe left the hoſpital."

Of this patient Mr. Abernethy, a year afterwards, heard that the abſceſs did not appear again, but the pain in her loins recurred, as might be expected.

Case IX. "Elizabeth Hart, about thirty years of age, had ſuffered greatly from pain in her loins for ten months. During that time matter had formed, and made its way down beneath Poupart's ligament, in ſuch quantity as conſiderably to diſtend the faſcia of the thigh. She was much reduced in ſtrength, and in the appearance of health, by this complaint; but, as her conſtitution was good, and ſhe could move the ſpine with facility, there was no reaſon to ſuſpect any diſeaſe of the bone.

"I punctured the abſceſs, and diſcharged two quarts of very healthy pus, ordering her occaſional emetics after the orifice had cloſed. She could not continue them regularly, however, as, during their uſe, her bowels became diſordered, and ſhe loſt her appetite and ſtrength. The accumulation of matter was, notwithſtanding, evidently delayed by them; for when, at the end of three weeks, I next punctured the abſceſs, only one quart of ſerous fluid was evacuated. After the ſpace of a month had elapſed, another quart was diſcharged. During this time ſhe had taken emetics occaſionally; but her health was far from good, and the pain in her loins was ſtill conſiderable. I had now witneſſed the beneficial effects of *electricity* in the caſe of the laſt patient, and reſolved upon trying it here. It was accordingly repeated three times a-week, for three weeks. At firſt, a ſmall collection of fluid in the abſceſs was perceptible; but this was gradually abſorbed; and by the end of the third week, there was no longer any pain in her loins, her health was greatly improved, and ſhe was able to walk about, without the leaſt appearance of her former complaint."

This patient was diſcharged from the hoſpital, but came once a-week, for ſome time, to be electrified. A ſubſequent report of the permanence of her caſe appears in a note. Mr. Abernethy there obſerves, "The two laſt caſes point out to notice a remedy that is likely to be of much advantage in the future treatment of lumbar abſceſs. My experience of it, however, has not yet enabled me to determine how far it may be *generally* beneficial. In one inſtance where I employed it after the abſceſs had been once punctured, it kept the matter from collecting for a long time; but the pa
growing tired of the confinement, and apprehenſive leſt th
ſhould be again employed, left the hoſpital without m
Of another, and ſomewhat analogous diſeaſe, in wh
though not with complete ſucceſs, I ſhall here relate

firſt remarking, that all the obſervations which I have made on electricity applied to diſeaſed parts, lead me to conclude, that it acts as a ſtimulus, which has the peculiar effect of *accelerating that proceſs which happens to be going on at the time.* Thus, in ſome ſtates of inflammation, it haſtens ſuppuration, whilſt in others it promotes diſperſion. We ſhould therefore always endeavour, previous to the uſe of this remedy, to bring the tumor or abſceſs into that ſtate in which its progreſs is ſtopped, and in which, perhaps, it is rather inclined to recede; and by this rule I have been guided in the application of this remedy to lumbar abſceſſes.

"I have alſo been attentive to proportion the number and ſtrength of the vibrations to the effect which they appeared to produce on the abſceſs: their operation ſeemed to be moſt beneficial when they occaſioned a kind of irritation or ſlight uneaſineſs in the part for a ſhort time after their application. But if this ſenſation amounted to pain, or if it was of too long continuance, I then ſuppoſed that the ſtimulus had been employed in too great a degree.

CASE X. "Iſrael Brooks, aged 25, about two years ago, was firſt ſeized with violent pain in his loins, which prevented him from either riding or walking for ſome time. About three months afterwards, he had the rheumatiſm in the joint of one of his fingers, which ſhifted to his wriſt, where it produced a thickening and diſeaſe of that part; and at preſent, all the carpal bones are evidently diſeaſed, and diſplaced. This diſeaſe alſo attacked his left knee, where it occaſioned an enlargement of the joint, that ſtill continues. Two months after this, he diſcovered a ſwelling beneath the glutæus muſcle, which has gradually increaſed; and ſince that time the pain in his loins has become much leſs ſevere, but a ſenſation of great weakneſs remains. This abſceſs was ſhewn to me at the hoſpital, as an inſtance of a remarkably large one; and there was no doubt but that it contained between two and three quarts of matter. There was alſo a prominence of the faſcia on the front of the thigh below Poupart's ligament, accompanied with evident fluctuation. The ſeveral gentlemen who examined this latter tumor, thought they could perceive an impulſe given to it from within, whenever the patient coughed; whence it was ſuppoſed to have its riſe from a lumbar abſceſs: but whether the abſceſs under the glutæus muſcle communicated with the loins or not, we were unable to determine, as no ſuch impulſe could be felt in it.

"I gave the patient *emetics* of vitriolated zinc and copper; and kept up an eruption of pimples on the ſkin covering the abſceſs, by rubbing it with a ſtrong ſolution of tartariſed antimony. Gentle electric vibrations were alſo daily paſſed from the loins through the front of the thigh, and alſo through the glutæal abſceſs. By this treatment, continued for two months, the tumor was very much reduced in ſize; that is, as far as could be judged of by the eye; for its ſituation prevented any accurate meaſurement of it. In ſpite of

our endeavours, however, the patient's health had declined since his admiſſion into the hoſpital; and in proportion as he loſt ſtrength, his other local complaints became worſe. As it was now ſummer-time, and he had an opportunity of going to the ſea, which had formerly been of ſervice to him, I punctured the glutæal abſceſs without loſs of time, let out three pints of healthy pus, and then healed the opening. His weakneſs increaſed conſiderably after this diſcharge, and all his other complaints were much aggravated. The electricity was ſtill perſevered in; and at the end of three weeks, the quantity of matter in the abſceſs was very ſmall; I cannot ſuppoſe it was more than eight ounces. I very much wiſhed to have had an opportunity of making freſh punctures in this caſe; but the ſtate of the patient's health obliged me, however reluctantly, to diſcharge him from the hoſpital.

"I have always found that abſceſſes, evacuated in this manner, filled again to one half or two thirds of their original quantity in the ſpace of a fortnight: ſo that here alſo, the beneficial effects of electricity are, in my opinion, ſufficiently manifeſt."

We have already ſpoken of the *valvular form* of the opening recommended at the outſet of this diſcovery; but it appears, from what the author has obſerved in concluding the foregoing caſes, to be a matter of ſecondary importance. He ſays,

"When I firſt began to open lumbar abſceſſes in the method I have recommended in this and my former Eſſay on the ſubject, I was extremely ſolicitous to do it in ſuch a manner that *the inner part of the aperture* might act like *a valve*, to prevent any matter from oozing out, ſo as to keep the orifice open. I have found, however, that great care in this reſpect was quite unneceſſary. I now make the opening with very little obliquity, and by uſing a broad abſceſs lancet, the wound is generally ſufficient to give a diſcharge to thoſe coagula which are ſo frequently found in the matter. I always completely empty the abſceſs, and then bring the lips of the orifice together by means of lint and ſticking-plaiſter, as after the operation of phlebotomy; and over theſe a compreſs and bandage are applied. I dreſs the wounds every ſecond day, and of late have found little difficulty in healing them, though many of them granulate before they completely unite. The only troubleſome circumſtance that has lately occurred to me, has been an enlargement of the lymphatic glands on the front of the thigh, at the place where the abſceſs has been opened.

"With regard to the *time of repeating the operation*, it muſt be regulated entirely by the circumſtances of the caſe; the matter collecting much faſter in ſome perſons than in others. It is beſt, I think, to wait until the integuments are ſufficiently elevated to allow of a puncture being made in them without any hazard of wounding the veſſels underneath. Many patients bear even the firſt diſcharges

without any loſs of ſtrength, notwithſtanding the quantity of matter evacuated is very conſiderable; and almoſt all that I have ſeen, improved in health under the ſubſequent ones. The great diſturbance that enſues, when, either by accident or deſign, a permanent opening is made in a lumbar abſceſs, ſhould render ſurgeons extremely anxious to avoid ſuch an occurrence altogether, if poſſible, or at leaſt to delay it for a conſiderable time: and although the danger and the ſufferings of the patient, when the abſceſs is opened, will be much greater where there is diſeaſe of the vertebræ; yet, as we had an opportunity of obſerving in the third caſe, this caution cannot be diſregarded with ſafety, even when there is no reaſon to ſuſpect any morbid condition of the ſpine."

After profeſſing to have ſome reliance on emetics and electricity in this diſeaſe, Mr. Abernethy ſays, "Where the vertebræ are ſound, the diſturbance excited by opening the abſceſs will in general ſubſide gradually, and the wound will at laſt become indolent; in which ſtate it may remain for a conſiderable time before it entirely heals, but without affecting the patient's conſtitution. Perfect *quietude* ſeems indiſpenſably neceſſary in the irritable ſtate of this diſorder. I have thought iſſues very uſeful in ſome caſes; but in others I could not perceive much advantage derived from them. A *ſolution of opium injected*, in one caſe, ſeemed beneficial, though it did not aſcend above Poupart's ligament. From reflecting that the ſtate of the conſtitution follows, and correſponds with, that of the abſceſs, I am ſtrongly inclined to believe, that injections may be uſeful, in preventing the cyſt, when it has become open, from acquiring that morbid condition which induces the hectic fever. In the records of former practice, we read of many extenſive abſceſſes, into which irritating injections were daily thrown. According to the ideas which now prevail among ſurgeons, the additional irritation excited by theſe, would be ſuppoſed to create great miſchief; yet, we are told that theſe patients recovered perfectly, and perhaps for the very reaſon I have ſuggeſted, viz. becauſe the abſceſs was prevented from falling into the peculiar morbid ſtate which induces hectic fever.

"The injecting the cavity of a lumbar abſceſs cannot, I believe, be effected, unleſs a flexible pipe, ſuch as a hollow bougie, could be introduced into it from beneath Poupart's ligament; when the injection might be thrown in, and applied to the whole ſurface of the cyſt. In general, however, it would require a new opening to be made through the ſkin and faſcia below Poupart's ligament, in order to effect the eaſy introduction of ſuch a canula."

The medical treatment of this diſeaſe belongs to the phyſician, and may be found in our firſt volume under the head of *Hectic Fever*. Mr. Abernethy ſuggeſts, that he has ſeen good effects from opium, given at regular intervals, as a means of leſſening the pain and irritability of the abſceſs.

Sect. V. Paronychia *or* Whitloe.

The panaris or whitloe, called by the Greeks *paronychia*, is a phlegmonous abſceſs appearing about the nail (as the Greek term expreſſes it), or at the extremities of the fingers. This diſeaſe is claſſed into four kinds from the different ſeats of it, and it is particularly neceſſary to diſtinguiſh each ſpecies from the other, on account of their different degrees of importance, and the neceſſity of treating them differently.

1. The *firſt ſpecies* is ſituated round the nail, immediately under the cuticle or epidermis. It is in general a diſeaſe of little conſequence, but may be made troubleſome by ill treatment.

It begins by forming a little ſwelling, attended with a degree of redneſs, and ſome pain at one corner of the nail. A linen compreſs dipped in ſpirit of wine and camphor, applied moderately tight round the finger, and kept conſtantly moiſt, very frequently proves ſufficient to cure the complaint in a few hours, and prevent the formation of matter. A lady who was very ſubject to frequent attacks of this diſeaſe, had been taught always to treat it with the good old woman's remedy, a bread and milk poultice, and by this means the complaint frequently laſted a fortnight, and proved extremely worrying and troubleſome. Her ſurgeon, however, directed her, as ſoon as ſhe felt the leaſt pain in her finger, to dip the part and wrap it up in cloths wet with ſpirit of wine and camphor; and by this management ſhe never afterwards had a whitloe that proceeded to ſuppuration.

But if, notwithſtanding theſe precautions, matter ſhould ſtill make its appearance, which is generally does at firſt, by one white ſpot under the cuticle, we muſt not delay cutting off the cuticle from that ſpot immediately, and from every part of the finger where it is raiſed. The application of a piece of rag, wet in a ſolution of muriated ammonia, or even vinegar and water, and renewed when dry, is then ſufficient to cure the diſeaſe in four and-twenty hours. But if, on that evening, we delay opening the cuticle, which is eaſily ſeparated from the ſubjacent ſkin, it becomes looſened by the matter, which extends perhaps round the finger, and ſometimes a conſiderable way down it, and what is worſe, deſtroys the adheſion of the nail to the cuticle from which it is produced. Hence there is a neceſſity for caſting off the old nail, and conſequently waiting for the growth of a new one, which makes a tedious and troubleſome diſeaſe of one that would have been well in a few hours if properly treated at the outſet.

2. The *ſecond ſpecies of whitloe* is ſeated immediately in or under the cutis, in the adipoſe membrane about the end of the finger. The inflammation, being greater here, and alſo the pain, from the greater

ſenſibility of the parts concerned, the diſeaſe becomes of a little more conſequence. There is a ſtrong throbbing and pulſation in the part, and a conſiderable elevation of the ſkin. We may attempt to diſperſe this abſceſs by immerſing the finger for half an hour at a time in warm water, and by keeping rags, wet with the ſaturnine water, conſtantly applied to the part; but if theſe attempts ſhould fail, the ſooner the matter finds an iſſue outwardly, the better; every thing, therefore, that tends to remove the obſtacle to the exit of the matter, ſhould be ſpeedily attempted. The cuticle in theſe parts is very thick, and it often happens that the matter ſhall have got through the ſkin, and ſhall not be able to make its way through the epidermis. For the natural thickneſs of the cuticle is here increaſed by the inflammation, and by the practice of ſoaking the part conſtantly in a bread and milk poultice. This is evident to the ſenſes, for the cuticle becomes white and perfectly opaque, reſembling that of waſherwomen who have been ſoaking their hands all day in water.

In ſlight caſes of this ſort, the ſeparating of the lamellæ of the cuticle from each other, or, in other words, the thinning of the cuticle, proves ſufficient to afford an outlet, either at the time or in a few hours after, to the matter, and to cure the diſeaſe. In ſeveral inſtances, where there may exiſt an evident tumor, with no fluctuation, but, from all appearance, a tendency to ſuppuration, we may ſucceed in preventing farther miſchief, by plunging a knife into the prominent part through the ſkin and fat; which effect is, in all likelihood, produced by unloading the veſſels of the part, in the ſame manner as when topical bleeding cures inflammation.

3. The *third ſpecies of whitloe* is ſeated underneath the ſheath of the flexor tendons of the fingers. This is a diſorder infinitely more violent and dangerous than either of the two former. The matter being deeper ſeated, under ſtrong ligamentous parts, ſuch as thoſe thick bands placed at intervals over the flexor tendons to confine them in their poſition, meets with full more difficulty in finding its way outwards. It therefore inſinuates itſelf under and along the ſheath of the tendons, and gets into the hand, where the fluctuation is generally firſt felt in the palm, under the aponeurotic expanſion of the palmaris muſcle. From thence, the matter ſometimes proceeds along the palm of the hand, and having reached the annular ligament of the carpus, paſſes under that into the fore-arm.

The pain ariſing from this ſpecies of the diſeaſe is moſt excruciating, not only from the inflammation of theſe ſtrong parts, but alſo from the very great reſiſtance they make to the diſtending power of the matter. A great degree of fever is conſequently excited, the patient can have no reſt, and a greater or leſs degree of delirium enſues, according to the greater or leſs violence of the complaint.

To prevent all the fore-mentioned evils, it would perhaps be only neceſſary to make an early inciſion into the part firſt affected, through the ſtrong ligamentous bands confining the tendons; but one thing

is to be obſerved, that if we make a ſimple inciſion, the great ſwelling and diſtenſion of the parts will prevent that inciſion from having any effect, and the wound will appear cloſed almoſt as ſoon as it is made. It ſhould therefore be a rule, in ſuch caſes, to cut off a portion of the integuments, and thus make a large and evaſated wound, which admits of a free diſcharge of all the matter, and procures immediate relief to the patient. If the tendon itſelf be diſeaſed, or the ligamentous bands which confine it, it will be neceſſary, not only to make an inciſion through them, but to remove part of the ligament, and even part or the whole of the tendon; for that, if it be diſeaſed, will infallibly ſlough away. In a word, at all events, a free opening is to be made; otherwiſe we might as well make none.

If this opening be made very early, all the dreadful miſchiefs we have been deſcribing, and which ſometimes lead on to amputation, ſometimes even to the deſtruction of the ſuffering patient, might be prevented. However, in whatever ſtage of the diſeaſe the opening may be made, it is right to follow it up as far as the matter reaches. If it ſhould extend through the palm of the hand, the aponeuroſis of the palmaris muſt not only be ſimply cut through, but freely divided or ſet looſe in various directions, that there may be no tightneſs or tenſion remaining. It is even neceſſary to follow up the matter through the carpal ligament and into the arm, if it ſhould have reached ſo far. But all theſe evils may in general be prevented, as we have before obſerved, by an early opening; and it is rather a matter of ſurpriſe, that this ſalutary and effectual mode of treatment ſhould ever have been neglected, becauſe there is one ſymptom which is peculiarly characteriſtic of this diſeaſe, and diſtinguiſhes it from every other ſpecies of paronychia. This is, a violent pain which the patient complains of in the internal condyl of the humeris, and which happens in conſequence of the two muſcles, called profundus and ſublimis, terminating in the flexor tendons of the fingers, which are the parts immediately affected in this complaint.

The beſt dreſſing for this kind of whitloe when opened, is oil of turpentine, or ſome ſuch ſtimulating and ſpirituous dreſſing. Greaſy and unctuous compoſitions generally increaſe the evil, and ſhould only be uſed as retentives to other dreſſings.

4. The *fourth ſpecies of whitloe*, is when the matter is formed under the perioſteum, between that and the bone, or in the body of the bone itſelf. In this, the pain is much more deep ſeated, and is not felt at the internal condyl of the humerus, as in the former ſpecies. The pain is very violent, but, in the beginning, not quite ſo much ſo as in the third kind. The ſwelling and tenſion of the finger are much leſs; and are, in general, confined to the part itſelf; but the pain ſoon increaſes ſo as to bring on fever and delirium as in the fore-mentioned caſe. The finger frequently becomes livid, and

is covered with little blisters containing a bloody serum, and threatening a mortification.

This is a case which demands the surgeon's utmost sagacity and resolution; yet we may venture to say, if these be properly exerted, that the result will generally be the preservation of the finger, which otherwise would infallibly be lost. When a violent pain therefore rages at the extremity of the finger, causing fever and delirium, though there may be no other symptoms to lead us, we are warranted in plunging a bistoury (in by the *side* of the finger, to avoid the tendons) through the periosteum, and down to the bone. This is frequently done to very great advantage, and in such instances the surgeon perhaps will give vent to a single drop of brown-coloured matter or purulent sanies; and this well-timed operation will commonly be sufficient to ease the patient, and remove all the violent symptoms which may have been induced.

The inexperienced practitioner will be apt to feel doubtful as to the propriety of attempting this operation, from the uncertainty of meeting with and giving issue to matter. But some have confidently assured us, that, whether matter be formed or not (in which however none can well be mistaken), the relief will be the same; so that nothing ought to deter us from the undertaking.

If it should be found, that the incision recommended does not produce the desired effect within four-and-twenty hours, and that the disorder should continue raging with as much violence as ever, the amputation of the finger must take place, and as we are certain that we must come to that at last, the sooner we do it the better; for we shall shorten the duration of the disease much by it, since all the violent symptoms will cease almost immediately upon the amputation of the finger, and therefore the patient will be relieved much sooner, than if we had waited the event of the disease.

There is an instance upon record of this being done without the assistance of a surgeon. A miller, seized with a whitloe of the third species, had suffered so cruelly for a fortnight, that he was grown quite furious with the pain. The inflammation of his finger had extended to the bend of the arm, and even to the arm-pit, where some very painful tumors began to be formed. In this situation he was resolved, without consulting any one, to cut off his finger with a hatchet. He placed the instrument a little below the articulation of the first with the second phalanx, and ordered his wife to strike upon it, which she, from fear of her husband's desperate situation, as well as from the hope of putting an end to his torment, executed. From that instant, all the symptoms were assuaged, the tumors began to disperse, and in a very few days all the pain was gone, and the patient experienced no kind of inconvenience during the rest of the cure. A methodical incision, however, made by a surgeon, might, perhaps, have afforded as much relief, and the finger might also have been saved.

The neceſſity and utility of early opening in the two laſt ſpecies of whitloe, is confirmed by another circumſtance, which experience enables us to aſſert with ſome degree of confidence. When, after having made a deep inciſion into theſe parts, with an intent to let out matter, it has ſo happened that no matter has followed the inciſion, it has been known, notwithſtanding, to flow plentifully on the following day, from the orifice. On this latter ſpecies of whitloe Mr. Latta has the following very judicious remarks.

Should the bone of the phalanx prove to be carious, it muſt be removed, as this will prevent any of thoſe ſevere ſymptoms that muſt otherwiſe unavoidably take place. In caſes of this kind, where the bone is found carious for any conſiderable length, we muſt inſtantly take it away altogether, laying open the finger from one end of the diſeaſed phalanx to the other. Thus, the patient will be freed from the ſeverity of the pain, and will likewiſe retain, in ſome meaſure, even more than could be expected, the uſe of the joint; while, if he wait for exfoliation, the ſurgeon will certainly be diſappointed, and the diſeaſe, inſtead of being cured, may be attended with the loſs of the next phalanx, or even of the finger itſelf.

In performing this operation, the following circumſtances muſt be attended to. The wound, as has already been ſaid, muſt be enlarged the whole length of the diſeaſed phalanx, when, with the point of a very ſmall round-edged ſcalpel, we muſt remove any portion of ligament or tendinous matter which adheres. But if the caries has gone to a very great length before the ſurgeon is called, the bone may be taken away at once by a pair of forceps, after having made an inciſion through the joint. The pain in this operation is, indeed, very ſevere; but it will be followed by immediate eaſe. After the bone is removed, we muſt interpoſe, between the edges of the wound, a ſlip of linen ſpread with emollient ointment, to prevent the upper parts from coaleſcing before the granulations have ſprung up from the bottom. Thus, every ſpecies of paronychia may be cured, but with the loſs of the nail in almoſt all caſes. However, this is not attended with any material inconvenience, as nature never fails to ſupply another, forming a preternatural hardneſs until this is accompliſhed. What follows is an inſtance of the efficacy of the method above recommended, and which ſhews in a remarkable manner how neceſſary it is to remove the bones of the finger as ſoon as they become carious. Mr. Latta relates the following caſe:

"J. F. a man of 54 years of age, had a ſtroke with an hammer upon the very point of his firſt finger of the left hand, which was followed by extreme pain, ſwelling, and inflammation, in that joint. As the diſeaſe ſtill continued to increaſe, the ſurgeon thought proper, in twelve days after the injury was received, to amputate the laſt joint of the finger. But, on the very firſt dreſſing after this operation had been performed, the inflammation was found to have pervaded the whole finger to the metacarpal bone, and an opening had

taken place on the second phalanx, the whole of the teguments mortified, and, in three weeks after, sloughed off completely, leaving the bone quite bare, so that it became necessary to remove it.

"Yet, upon taking off the bone of the last phalanx, it was found that the disease had invaded the metacarpal bone also; though, as the affection was but slight, it was hoped, that, by care and attention, the bone might be saved. But, instead of this, the pain, inflammation, and other bad symptoms, continued to increase; the whole integuments, with which the metacarpal bone was covered, became inflamed, thickened, and of a livid colour, as far as the articulation with the bones of the wrist; besides which, a sinus ran down between the integuments and bone for about two inches and an half, which was also laid open, in order to allow the bone to exfoliate; another opening being made in the inside of the hand to allow of a free discharge of matter. In about four weeks after, during which time the sore had become worse and worse, the patient was put under my care. I found the metacarpal bone carious, and enlarged, and such a severe swelling, pain, and redness, over the whole hand, that there was great reason to fear an amputation of the whole would be necessary, unless this bone could be taken away. The patient having willingly consented to any thing which had a chance of saving his hand, the operation was performed in the following manner. Having seated him on a chair, the fore arm and hand were laid upon a thin pillow upon a table, and an incision made from the wrist joint, immediately from the articulation with the bones of the wrist, along the whole course of the bone. The skin, cellular substance, &c. were then dissected with the greatest care, from both sides of the bone, throughout the whole length of it; and the bone being thus freed from every adhering part, whether muscular or tendinous, I opened the capsula of the joint with a sharp lancet-pointed scalpel; but, in doing this, though the utmost care was used, I could not avoid dividing the arterial arch which is formed by the junction of the ulnar, radial, and interosseous arteries. I instantly took up one end of this with the tenaculum; but finding it impossible to take up the other, either with the tenaculum or needle, on account of its being so far retracted, I applied several pieces of agaric, filling the wound at this part with folded pieces of caddice rising a little above the surface of the wound. All along the other parts of the wound its sides were brought together, and pieces of linen, spread with emollient ointment, put over the top of it, with some dry pledgets above all, and the dressings kept on by a roller put pretty hard round the hand, in order to compress the artery, and prevent any hæmorrhage. By means of an anodyne draught, with forty drops of laudanum, he had a good nights' rest, but, next morning, complained very much of pain in his hand from the tightness of the bandage. This being cut almost quite through, he got considerable ease; however, as the pain still continued severe, I ordered the whole hand, dressings and all, to

be immerſed in a ſolution of ſugar of lead, three times a-day, for upwards of an hour at a time. By this, and the uſe of an anodyne, the pain abated; and, on the fourth day, when the wound was looked at, almoſt one half of it appeared to be united. That part of the dreſſings, however, which was next the wriſt, was not meddled with, for fear of renewing the hæmorrhagy. The hand was then dreſſed as before, and the fomentations renewed; but, as the patient was now greatly weakened by the exceſſive diſcharge, and the many operations he had undergone, it was judged proper to allow him a more nouriſhing diet than formerly, with a few glaſſes of wine daily. In ten days from the operation, all the dreſſings were thrown out of the wound, which now looked well; and the ſides of it were brought exactly together, and ſecured in that poſture, by a flannel roller. In twenty-two days from the operation it was completely healed; and it has continued ſo for two years, during which he has worked at his buſineſs of an edge-tool maker as before."

From what occurred in this caſe, it is evident that it was of great uſe to the patient to heal a part of the wound by the firſt intention, to alleviate the inflammation, by immerſing the hand in a ſedative fomentation, and to exhibit opiates.

Sect. VI. *Of* Chilblains.

This well-known diſeaſe is produced by exceſſive cold applied to the extremities, and eſpecially if the part affected with cold has been too ſuddenly afterwards expoſed to heat. Chilblains are moſt common in the heels, but they ſometimes appear on the fingers, toes, arms, hands, or feet, or even on the tips of the noſe and ears. They are inflammatory tumors, attended with heat, redneſs, ſhooting pains, and great itching, and in ſome habits the limbs alſo ſwell conſiderably, and the ſkin burſts in ſeveral parts of them, diſcharging a thin fetid matter. Theſe ſymptoms particularly take place in the heels, the integuments of which are apt to mortify and ſlough off, leaving always very ill conditioned ulcers behind. Before theſe make their appearance, the parts generally aſſume a livid colour, and are covered with large veſicles ſimilar to thoſe produced in a ſcalded part.

Theſe troubleſome ſwellings being occaſioned by the application of too great a degree of cold to parts of the body where the circulation is moſt languid, the ſymptoms muſt of courſe differ very materially, according to the nature of the part affected, as well as the ſtrength of the patient, and the degree of cold applied. Children, or thoſe below puberty, are moſt ſubject to chilblains, as well from the laxity of their fibres, as from their being more frequently expoſed to thoſe cauſes which produce them; and thoſe who have once been ſubject to ſuch complaints are always liable, unleſs the

greateſt care be taken, by keeping the parts dry and warm, to have them again. At times, however, when the extremities have been expoſed to long and ſevere cold, it will be impoſſible, by any care or attention, to prevent the diſeaſe. As ſoon, therefore, as any ſign of it is perceived, if any ſnow is to be had, the parts ought to be well rubbed within a room without a fire; or, if ſnow cannot be got, we muſt take ice, or the coldeſt water we can find, into which the parts are to be plunged for a few minutes, and then gently, but perfectly, dried, after being taken out of the water. Theſe remedies will ſometimes prevent the diſeaſe from going to any length; but, ſhould it happen otherwiſe, or the chilblains have appeared before the ſurgeon is called, we may apply, on linen rags, the following ſolution:

(No. 49.) ℞. Ammoniæ muriatæ unc. ſs.
Aceti diſtillat. unc. vi.
Fiat ſolutio.

Or, the following, which is ſtill more to be relied on:

(No. 50.) ℞. Aluminis drach. ij.
Aceti unc. vi.
Sp. vini. rect. unc. ij. Fiat ſolutio.

Electricity, rubbing the parts with oil of turpentine, or camphorated oil, or volatile liniment, may be alſo of uſe. But it muſt be remarked, that, unleſs the patient can be perſuaded to keep the parts affected dry and warm during froſty weather, almoſt no application that can be uſed will be of any ſervice. As this complaint, when violent, ſeems always to ariſe from ſome defect of circulation, or laxity of fibres, general tonics promiſe to be of ſervice as a preventive. The ſea or ſhower bath are very efficacious in this way; and, if theſe be begun about the middle of September, and perſevered in for ſeveral weeks, there will be much leſs danger of chilblains during the enſuing ſeaſon than if no ſuch thing had been uſed. But, in caſe of ulcerations, which are common in young people who generally neglect the diſeaſe, we muſt avoid either relaxing ointments, or emollient poultices, for both theſe have a tendency to promote the growth of fungous fleſh, with which theſe ulcers are conſtantly overrun. Inſtead of this, the whole ſurface of the ulcer muſt be deſtroyed by lunar cauſtic; and, after the eſchar has ſloughed off, we muſt dreſs the ſore in the moſt ſimple manner. If the cauſtic has reached ſo deep as to deſtroy the whole of the diſeaſed ſkin down to the cellular ſubſtance, there will be no danger of the parts filling up with found fleſh.

In Scotland chilblains are exceedingly common among the country people, whoſe heels they generally affect. They produce fungous ulcerations; and it is a very common remedy to deſtroy the fungous fleſh at once by a hot iron, which not only effectually removes the complaint for that time, but it never afterwards returns in that place. In the northern parts they apply alum beat up with the

white of an egg, and put on a pledget of tow, and this with no ſmall benefit to the patient.

Sect. VII. *Of* Contusions *and* Sprains.

Contuſions of the integuments and muſcles produce pain, ſwelling, and inflammation, and theſe, in ſome caſes, may extend to a conſiderable degree; but in general they are leſs violent than what take place in caſes of ſprains of ligaments or tendons; for in theſe there is frequently a total loſs of motion for many weeks, and ſometimes for years, if proper attention be not paid. An effuſion of fluids always ſucceeds the injury, which ſeems to be, for the moſt part, of a ſerous nature, as the ſkin uſually retains its natural colour; ſometimes the tumefied parts are of a deep red, or leaden colour, owing to a rupture of ſome veſſels conveying red blood.

In *the treatment of contuſions and ſprains*, theſe circumſtances require attention: 1. To endeavour to prevent the ſwelling as far as is practicable; 2. To employ thoſe remedies afterwards which are known to be moſt powerful in preventing or removing inflammation; 3. To reſtore ſtrength to the joint after the ſymptoms have been ſubdued. In contuſions of the cellular ſubſtance, and even of the muſcles, the effuſed fluids are commonly ſoon abſorbed; but in ſprains of the tendons or ligaments, a very troubleſome, painful thickneſs of the injured parts is apt to continue for a great length of time, and in ſome inſtances even for life.

It is neceſſary, therefore, to obviate theſe ſymptoms as ſoon as poſſible; and for this purpoſe, cold aſtringent applications, as water, vinegar, &c. are moſt commonly uſed. Others again, with a view to relax the parts fully, make uſe of water as hot as the patient can bear it. By immerſing the injured part in theſe immediately after the injury is received, the effuſion will at leaſt be ſomewhat obviated. When the pain is exceſſive, opiates become neceſſary. On the cure of theſe accidents, Mr. Latta makes the following remarks.

In the treatment of ſprains, it is the firſt buſineſs of a ſurgeon to examine whether the joint has received any other injury, or if there is reaſon to believe that the ligaments have only been ſtretched in ſuch a violent manner as to lacerate ſome of the blood-veſſels, and deſtroy the tone of the abſorbents, and thus render them paralytic, and incapable of executing their office for a time. If any of the bones of the joint are found to be diſplaced, they muſt be reduced, according to the methods already laid down; after which, the joint muſt inſtantly to be immerſed in a veſſel of water as hot as the patient can bear it, the heat always under 112° of Fahrenheit, by which means ſuch a relaxation will take place in the veſſels of the parts immerſed, as will allow the quantity of effuſed or ſtagnating fluid to

paſs on almoſt as freely as before; and that, whether it be blood, or any other, the vis a tergo being ſtill ſufficient for that purpoſe, even though the veſſels through which they paſs have been much injured. In this way, the ſudden and very great ſwelling and tenſion, which take place immediately after the injury, are almoſt completely prevented. After the limb has thus been immerſed for a ſufficient time in the water, a number of leeches (in an adult, who has received a violent ſtrain, not leſs than a dozen), ought to be applied; and after they have dropped off, unleſs the pain of the diſeaſed limb be very great, it ought again to be immerſed in warm water of the ſame heat as before, by which the bleeding will be promoted; and ſometimes, in caſes of violent ſprains, it is of ſervice to take away a great quantity. The bleeding being ſtopped, we muſt place the limb upon a pillow in the moſt eaſy poſture; the patient is to have an opiate, and the joint ſhould be covered with ſeveral folds of flannel, moiſtened with a ſaturnine ſolution. But, if the inflammation and pain ſhould not decreaſe in twelve hours, or ſhould increaſe within that period, we ought again to apply the leeches and warm moiſt cloths as before.

In very violent ſprains of the wriſt, it will be found of great ſervice to ſupport the arm and hand by a ſplint, reaching from the point of the finger to the elbow, and of ſufficient breadth to cover the under half of the arm. Another of equal breadth ought to be applied to the outſide, paſſing over the wriſt to the middle of the metacarpal bones. The ſplints ought to be well moiſtened in a ſolution of vitriolated zinc, and ought to be kept firm in their places, by means of a flannel roller put round the arm; and all the dreſſings, as well as the arm itſelf, ought to be kept conſtantly moiſt with the ſolution. If ſtill the patient be not relieved in eighteen or twenty hours, we muſt not heſitate at applying the leeches a third time, as well as the other medicines perſevered in, until he recovers. If he is plethoric, he ought to be freely purged every ſecond day, and to have his draught every night at bed-time; and if this courſe be perſevered in for three days, Mr. Latta affirms that the patient will not have any complaint in the affected joint on the morning of the fourth. He recommends, however, the uſe of the *volatile camphorated liniment*, chafing the limb well with it three times a-day, by which every degree of ſwelling which might remain after the pain is gone will rapidly decreaſe, until, in the courſe of three weeks at moſt, no degree of ſtiffneſs, pain, or ſwelling, will remain, and the only complaint will be weakneſs, which a ſhort time will alſo remove.

Where the application of leeches is not attempted, one of the beſt and eaſieſt remedies for a violent ſprain is a poultice made with vinegar, thickened with crumbs of bread and linſeed meal, and applied cold. After the inflammation and ſwelling have ſomewhat ſubſided, the following liniment will be of ſervice:

(No. 51.) ℞ Solutionis ſaponis moll. unc. ij.
Aquæ ammoniæ puræ drach. ij. miſce.

When the joint requires ſtrengthening, it may be done by pouring very cold water upon the part from the ſpout of a teakettle, increaſing every day the height from whence it is let fall; and, after each bathing, the joint muſt be rolled up with a narrow flannel bandage applied all round, beginning to roll from below upwards, and making the preſſure always equal over the whole ſurface.

Sect. VIII. *Of* Tumors *on the* Nerves.

Though none of our ſyſtems of ſurgery have included diſeaſes of this deſcription, we have the authority of an account of an uncommon tumor, formed in one of the axillary nerves, by Mr. Everard Home, to juſtify our giving the ſubject a place here.

"There is a particular ſpecies of tumor," ſays Mr. Home, "met with in the neck, and probably in other ſituations, which is contained in a cyſt, but is only looſely attached to it; yet generally over the whole ſurface by blood veſſels and cellular membrane. The tumor is of a yellowiſh white colour, and reſembles ſomewhat in its appearance and conſiſtence the human kidney. Its internal ſtructure is ſometimes the ſame throughout; but where it has been allowed to increaſe to a conſiderable ſize, ſome parts appear more compact than the reſt.

"This ſpecies of tumor muſt have been frequently met with. It is, therefore, unneceſſary to take up more time in giving a particular deſcription of it. The reaſon for mentioning it here is, to compare it with an incyſted tumor of a rarer kind; and to point out, that in its removal it is unneceſſary to do more than divide the membranous covering, and diſengage it by the finger. The parts will afterwards heal very kindly, and may be united by the firſt intention, if proper means are taken for that purpoſe. This I am enabled to ſtate from repeated experience.

"I have lately met with a tumor incloſed in a nerve, ſo very ſimilar both in external appearance and internal ſtructure to that juſt deſcribed, that I muſt conſider them as differing only in ſituation. This tumor from its connection with the nerve produces ſymptoms peculiar to itſelf. It may, therefore, be conſidered in this point of view as a diſtinct diſeaſe; and as it is a very uncommon one, I ſhall give a particular deſcription of the caſes which I have met with, and an account of the operation for its removal.

"A lady, 22 years of age, had a tumor on the outſide of the biceps muſcle of the right arm, juſt below the middle. It was of the ſize of a ſmall pullets' egg, of an elliptical form, and moveable in the ſurrounding parts, but principally in a lateral direction. It was extremely painful when any thing preſſed againſt it, which made her

very careful in defending it from external accident. It had been ſeveral years in arriving at this ſize, but was now increaſing more rapidly, which induced her to ſubmit to have it removed. The operation was performed by Mr. Hunter, in which I aſſiſted him. In the operation, handling the tumor, or moving it from its place, gave the moſt excruciating pain. When the tumor was fully expoſed, it had a ſmooth ſhining external ſurface, and terminated at its *upper and lower* ends in a ſtrong white chord, which proved to be the muſculo-cutaneous nerve. Upon cutting into the tumor, it was diſcovered to be incloſed in the nerve. This diſcovery was not made till the tumor had been every-where laterally diſſected from the ſurrounding parts. It was, therefore, thought prudent to remove the whole by dividing the nerve at the two ends of the tumor. The artery belonging to the nerve bled ſo freely, that it became neceſſary to apply a ligature on both the cut ends of the nerve, as the artery itſelf could not be got at. An attempt was made to heal the wound by the firſt intention, which did not ſucceed; but it got well as ſoon as wounds of that ſize uſually do, by ſuppuration and granulation. The patient loſt the uſe of her forefinger and thumb, and there was a numbneſs in all the parts ſupplied by that nerve. The ſkin which covered them was unuſually tough and dry, and the cuticle came off in ſmall ſcales. Before the operation, the pain was not confined to the tumor, but extended to all theſe parts. On examining the tumor, it was found that three inches in length of the nerve had been removed; that it was divided into two portions, each of them very much flattened, and paſſing over two oppoſite ſides of the tumor. There was alſo a nervous expanſion not thicker than a common membrane, which completely inveſted the whole of the tumor; and when that was divided, it could be readily ſeparated every-where, except at the *extremities*, where the connection was ſomewhat ſtronger.

"When the tumor was divided, and the cut ſurface accurately examined, it had the appearance, in the centre, of ſerpentine nervous fibres running in the courſe of the nerve. Theſe were ſeparated from each other, and the interſtices filled up with the ſubſtance of the tumor; but that part of the tumor which was exterior to theſe fibres had ſomething of a radiated ſtructure."

"Peter Coillot, a Frenchman, 35 years of age, was admitted a patient under my care in St. George's hoſpital, July 13, 1796, with a tumor, *which was ſituated in the middle of the hollow*, between the two folds of the *armpit*. When the arm was hanging down, it projected very little; but when the arm was raiſed, it became very prominent, that poſition of the parts bringing the tumor forward. It admitted of lateral motion, which was, however, very confined, being juſt ſufficient to aſcertain that it had no firm connection with the parts behind.

" The firſt ſymptom which he felt was a darting pain in the fingers of that hand. This came on in July, 1795, and increaſed from that time; but the tumor in the arm-pit was not diſcovered till June, 1796, and was then as large as a ſmall pullets' egg. When he came into the hoſpital, it was more than double that ſize. The pain he felt in the tumor and in the arm was very ſevere. This was very much increaſed by any preſſure againſt the tumor.

" Its relative ſituation to the great nerves and blood veſſels, its obſcure motion, and the uncommon degree of pain which it occaſioned, were unfavourable circumſtances for an operation. I was therefore induced to try a variety of means to relieve the ſymptoms, but theſe proving ineffectual, and the pain becoming worſe, the removal of the tumor ſeemed to be the only means left that could give him a chance of getting well. To this the man moſt chearfully ſubmitted, as he declared that his preſent ſufferings were inſupportable.

" During the operation, the arm was raiſed as high as poſſible to bring the tumor fully in view. Upon dividing the ſkin and the cellular membrane, the firſt object which preſented itſelf was the axillary vein ſtretched over the anterior ſurface of the tumor. This was drawn to one ſide, and retained in that ſituation. When the tumor was laid bare, it was found to have a ſmooth external ſurface, and the end next to the arm terminated in a ſtrong white chord. When this was pulled, it did not give pain in the part itſelf, but the arm felt over ſtretched, *and gave* him the greateſt uneaſineſs. This circumſtance brought to my recollection the caſe of the young lady above related, and led me to conſider this to be ſimilar to it. I therefore cut through the external covering of the tumor, which was only a thin membrane, and diſſected off a conſiderable portion of it. This enabled me with the finger to detach the remainder of the tumor from its covering, and entirely to diſengage it, upon which it was immediately expelled by the action of the ſurrounding muſcles. No hæmorrhage enſued, and the parts were ſuperficially dreſſed. The patient immediately after the operation felt relieved from the diſtreſſing ſymptoms he before complained of.

" The tumor was of a yellowiſh white colour, about three inches and half long, two inches thick, and of an oval form. When cut through, it was found to conſiſt of a whitiſh very firm ſubſtance; in the centre of which there was a very obſcure fibrous ſtructure; and towards the outer ſurface the texture was indiſtinctly radiated. The day after the operation, the patient was free from pain, and could move his fingers without uneaſineſs. He continued going on well till the fourth day, when he loſt his appetite, had an unuſual heat in his ſkin, and his *pulſe exceeded its natural frequency*. On the fifth day he was nearly in the ſame ſtate; on the ſixth his pulſe was *quick*, and had a ſharpneſs in the ſtroke. His ſkin felt hotter than before, and he had a preternatural thirſt; his ſpirits were depreſſed, and he

felt perſuaded that he ſhould not recover. On the next day in the forenoon he died.

" On examining the parts after death, the tumor was found to have been incaſed in one of the large nerves which form the axillary plexus: the principal ſubſtance of the nerve paſſed along the poſterior ſurface of the tumor. There were alſo ſome other branches much flattened, and as it were imbedded in the nervous expanſion ſurrounding the tumor. The cyſt was now much contracted, and more than four times thicker than at the time of the operation. *In conſequence of having been inflamed*, the cavity was lined with coagulated lymph, and almoſt filled with coagulated blood, as ſuppuration had not completely taken place. The inflammation and ſwelling had extended ſome way into the ſurrounding parts, which were alſo conſolidated into one maſs, and with difficulty ſeparated by diſſection.

" The other parts of the body were found in a natural ſtate, ſo that there was no evident cauſe of death but what aroſe from a conſiderable degree of inflammation upon the ſubſtance of a large nerve for three inches in length, which alſo affected the other nerves of the plexus.

" A ſimilar tumor had formed in one of the other nerves, but was much ſmaller in ſize. It lay directly between the axillary artery and the tumor which had been removed. In this ſituation it prevented the pulſation of that artery from being felt during the time of the operation, which I was before at a loſs to account for.

" The ſtructure of this tumor was exactly ſimilar to that from the arm of the young lady, except that the nervous fibres in the centre were rather more diſtinctly ſeen, the ſpiral direction of the fibres being readily diſtinguiſhed by the naked eye; *in other reſpects*, it was exactly the ſame. The want of diſtinctneſs in thoſe of the larger tumor may therefore be reaſonably ſuppoſed to be the effect of the increaſe of ſize by which they were rendered obſcure.

" From theſe caſes we *are enabled to aſcertain the ſymptoms peculiar to tumors in the ſubſtance of nerves*, and to form a judgment reſpecting the mode of removing them.

" They may be *diſtinguiſhed from other tumors* by a pain which is felt in the direction of the tumor, and in the part beyond it, even at the time when the tumor itſelf is moveable laterally in the ſurrounding parts. They may be alſo diſtinguiſhed by the motion of the tumor, being chiefly in a lateral direction, but not in the direction of the nerve to any extent; and by the attempt to produce this longitudinal motion, being attended with conſiderable pain.

" In the *removal of ſuch tumors*, we find that ſo far as we are juſtified in drawing concluſions from two inſtances, the taking away three inches of a nerve is productive of leſs violent effects than are occaſioned by inflammation and ſuppuration in the ſubſtance of the nerve for an equal extent.

"The inflammation of a nerve, like that of a tendon, appears to affect the general ſyſtem in a greater degree than would be expected, by a man unacquainted with pathology, from the little ſeverity of the ſymptoms, or ſenſation in the part affected."

END OF THE THIRD VOLUME.

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